AMERICAN AGRICULTURIST

FOR THE

Farm, Garden, and Household.

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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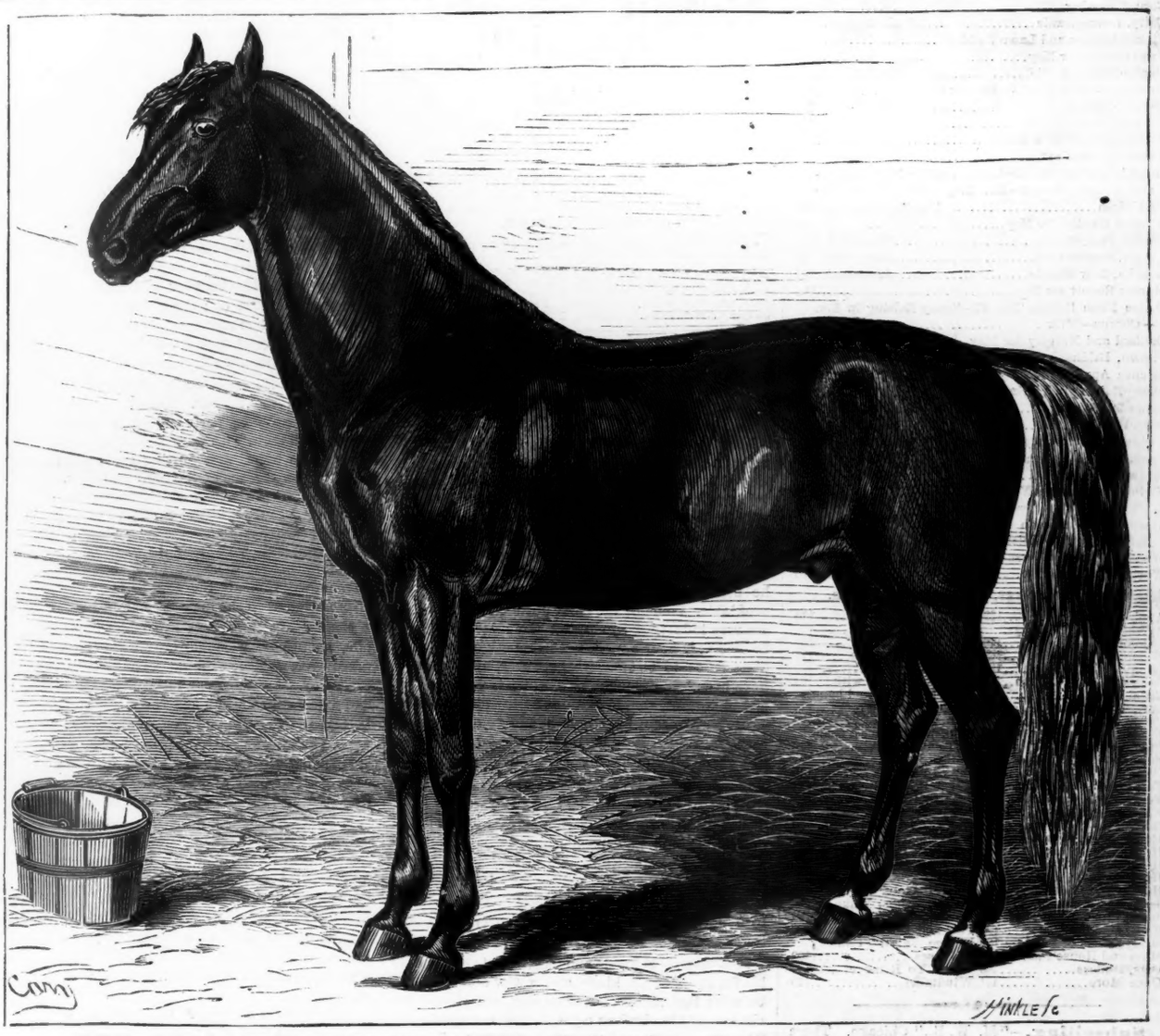

THE STALLION "NIGHTSHADE."—THE PROPERTY OF H. K. COMSTOCK, OF WHITE PLAINS, N. Y.

At the Connecticut State Fair held in September, 1874, the first premium for stallions and their colts was given to a four-in-hand-team of matched jet black stallions, consisting of "Superb," a noted trotter, and prize-winner, and his three sons, "Nightshade," "Success," and "Black Diamond." The gold medal at the Dutchess County, N. Y., Fair, in 1867, was won by "Superb" over several noted horses, and he gained the first premium at the same fair in 1869, along with six of his colts, and again the same year with five of his colts at the Queen's County, N. Y., Fair. "Superb" is by "Ethan Allen," out of "Mischief," and thus possesses a share of the blood of both the Morgan and Hambletonian families, including several crosses of imported "Messenger." His breeding is therefore very high, while his performances and character are in keeping with his breeding. He transmits his characteristics in a very marked degree to his colts, which show his excellent temper and great docility, along with his form, color, and trotting qualities. Amongst the best of his colts is "Nightshade," whose portrait, drawn from life, is given above. This horse was foaled in 1868, his dam being a highbred mare from Virginia. His color is glossy black, with a small star on his forehead, and he is nearly sixteen hands high. His form and carriage are fine, and his disposition very gentle and docile. He has a number of colts that are promising trotters, and especially suitable for roadsters or carriage horses.

At the present time there is no more promising business than the production of riding, driving, and carriage horses. The demand is everywhere rapidly exhausting the supply, and the exportation of such horses to Europe would now be a profitable business if the supply were on hand. Although heavy horses may have their place in farm work, the horse for the road and for general purposes must be the progeny of a thoroughbred stallion of substance and of speed. "Superb" and his two colts, "Success" and "Black Diamond," are in the stud of Mr. James Frost, of Washington Hollow, Dutchess Co., N. Y., and "Nightshade" will spend the coming season at the farm of the owner, Hollywood, near White Plains, Westchester Co., N. Y.

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Subsoiling.—"H. W. B.," Chicago. There are lands that would be injured by subsoiling. It is only those with compact clay or gravel subsoils, that need this process. Many sandy or light loam soils, with open subsoils, are sufficiently loose, and need compacting rather than to be made more open.

Preserving Fence Posts.—"B. G.," Delaware Co. The various chemical processes for preserving timber, are all too costly for application to fence posts. They can only be economically applied when a large number are to be operated on. Posts may be made more durable by filling the holes in which they are set with large stones, so that air may circulate about the lower part of the post, and that no earth shall touch it; also, if the post is washed with thick lime wash every few years. The process of painting posts with oil and charcoal dust, does not prevent decay in their interior.

Calendar for May.

Day of Month.	Day of Week.	Boston, N. England, N. York State, Michigan, Wisconsin, Iowa, and Oregon. Sun rises.	Sun sets.	Mo'n rises.	N. Y. City, Ct., Philadelphia, New Jersey, Penn., Ohio, Indiana, and Illinois. Sun rises.	Sun sets.	Mo'n rises.	Washington, Maryland, Virginia, Kentucky, Missouri, and California. Sun rises.	Sun sets.	Mo'n rises.
		H. M	H. M	H. M.	H. M	H. M	H. M.	H. M	H. M	H. M.
1	S	4 55	7 0	2 39	4 59	6 56	2 56	5 2	6 52	2 54
2	S	4 53	7 1	3 21	4 57	6 57	3 20	5 1	6 53	3 20
3	M	4 52	7 2	3 44	4 56	6 58	3 44	5 0	6 54	3 45
4	T	4 50	7 3	4 8	4 54	6 59	4 10	4 58	6 55	4 13
5	W	4 49	7 4	sets	4 53	7 0	sets	4 57	6 56	sets
6	T	4 48	7 5	8 52	4 52	7 1	8 47	4 56	6 57	8 40
7	F	4 47	7 6	10 14	4 51	7 2	10 7	4 55	6 58	9 59
8	S	4 46	7 7	11 23	4 50	7 3	11 16	4 54	6 59	11 8
9	S	4 45	7 8	morn	4 49	7 4	morn	4 53	7 0	11 55
10	M	4 44	7 9	0 9	4 48	7 5	0 2	4 52	7 1	morn
11	T	4 43	7 10	0 57	4 47	7 6	0 52	4 51	7 2	0 46
12	W	4 42	7 11	1 30	4 46	7 7	1 26	4 50	7 3	1 21
13	T	4 41	7 12	1 58	4 45	7 8	1 55	4 49	7 4	1 52
14	F	4 40	7 13	2 17	4 44	7 9	2 16	4 48	7 5	2 14
15	S	4 39	7 14	2 38	4 43	7 10	2 38	4 47	7 6	2 37
16	S	4 38	7 15	2 58	4 42	7 11	2 58	4 46	7 7	2 59
17	M	4 37	7 16	3 24	4 42	7 11	3 25	4 46	7 7	3 27
18	T	4 36	7 17	3 44	4 41	7 12	3 47	4 45	7 8	3 50
19	W	4 36	7 18	3 59	4 40	7 13	4 4	4 44	7 9	4 8
20	T	4 35	7 19	rises	4 40	7 14	rises	4 44	7 10	rises
21	F	4 34	7 20	9 7	4 39	7 15	9 0	4 43	7 10	8 53
22	S	4 33	7 21	10 4	4 38	7 16	9 57	4 43	7 11	9 49
23	S	4 32	7 22	10 55	4 37	7 17	10 48	4 42	7 12	10 40
24	M	4 32	7 23	11 33	4 37	7 18	11 29	4 42	7 13	11 20
25	T	4 31	7 24	morn	4 36	7 19	morn	4 41	7 14	11 56
26	W	4 30	7 25	0 6	4 35	7 19	0 1	4 40	7 15	morn
27	T	4 29	7 26	0 35	4 35	7 20	0 31	4 40	7 16	0 27
28	F	4 29	7 27	1 0	4 34	7 21	0 58	4 39	7 16	0 55
29	S	4 28	7 28	1 22	4 34	7 22	1 21	4 39	7 17	1 19
30	S	4 27	7 28	1 41	4 33	7 23	1 44	4 38	7 18	1 44
31	M	4 26	7 29	2 7	4 33	7 24	2 9	4 37	7 18	2 10

PHASES OF THE MOON.

MOON.		BOSTON.	N. YORK.	WASH'N.	CHA'STON	CHICAGO.
	D.	H. M.	H. M.	H. M.	H. M.	H. M.
New M'n	5	10 20 mo.	10 8 mo.	9 56 mo	9 44 mo.	9 14 mo.
1st Quart	12	2 53 mo.	2 41 mo.	2 29 mo	2 17 mo.	1 47 mo.
Full M'n	20	4 8 mo.	3 56 mo.	3 42 mo	3 30 mo.	3 0 mo.
3d Quart.	28	1 46 mo.	1 34 mo.	1 22 mo	1 10 mo.	0 40 mo.

AMERICAN AGRICULTURIST.

NEW YORK, MAY, 1875.

May is a busy month. So much work crowds upon the farmer that he is in danger of being in a hurry. Hurried work is seldom well done. A certain amount of deliberation is necessary to work well, and even to work quickly. To go slowly but surely, is better than to go about a thing in a hurry, and have the work to do over again. The diligent man is industrious in making preparations before he begins to work, so that his industry may be profitable. Some of the most unsuccessful farmers are very industrious men, but their work does not tell. Every hour's work in this month, that is not done so as to be effective hereafter, might better have been left undone. That which is most urgent and important, should be done first. Planting and sowing will occupy the month, and to do this well is the most important business of the farm, because as we sow, so do we reap.

Hints about Work.

Feeding Cattle.—Beeves that have been fed for market, should now be finished off as rapidly as possible. The appetite will be stimulated by a few roots along with the dry fodder, and some exercise in a dry yard. The change of coat is accompanied by irritation of the skin, and the curry comb and brush should be used daily.

Root Crops.—Mangels and sugar beets are valuable for stock of all kinds, and a few acres should be sown this month. A deep rich soil should be chosen, and be broken up well, and manured with 20 loads of barn-yard manure to the acre. Lay off the surface in ridges 27 to 30 inches apart, roll or rake the ridges, and sow the seed with a hand-drill, at the rate of 5 pounds per acre. The middle of the month is the proper time in the northern states. A sprinkling of superphosphate of lime or guano, will help the young plants. A thousand bushels of roots, per acre, may be expected on rich soil with good care. Carrots may be sown this month for a field crop; two pounds of good fresh seed per acre is a proper quantity.

Corn.—Corn planting is on many farms the great work of this month. Plow deeply if the soil is deep, but shallow soils will not stand deep plowing. Harrow, mark out, and plant as soon as the ground is plowed; these operations should follow one another as closely as possible. Choose sound well-ripened seed, from ears that have been selected and kept for this purpose. Reject all moldy seed. To keep away birds, some steep the seed in warm water, in which a little pine tar has been stirred, and dry in plaster before planting. If the seed is sown with a drill or planter, it must not be soaked.

Crows and other Birds.—Crows are not so black as they are painted. On the whole they do more good than harm. While they will damage some corn at this season, they are working for the farmer the rest of the year. To poison them is a great mistake, as well as an unnecessary cruelty. Keep them out of the fields of sprouting corn, by scarecrows or any other devices, but their lives should not be sacrificed by shot or poison. The same will apply to the majority of birds. Even owls and hawks do some good, and there are methods of preventing them from doing mischief on the farm, without slaughtering them indiscriminately.

Grain Fields.—Fine fertilizers of any kind may be applied to winter or spring grain. Wood-ashes, poultry droppings, plaster or guano, are all valuable at this season.

Meadows.—Do not pasture meadows. There is nothing gained by it. It would be more profitable to buy hay or roots, than to do this. Any of the fine fertilizers before mentioned, are as applicable to grass as to grain crops.

Roads.—This is the best time in the year to repair roads. The surfaces of holes or gullies should be worked over with the pick and loosened before fresh earth is laid on; the union of the old and fresh earth is then more complete. Round up the center of the road, and lower the side ditches; a wet road can never be kept in good condition.

Mowing Machines.—On rainy days it will be well to overhaul the mower. Take out all the bolts, clean all the moving parts and gears with kerosene oil, then oil them with pure lard or sperm oil, and replace the bolts, first putting some clean tallow on the screw-threads of the bolts and nuts. When all is clean, throw a barn sheet over the machine, to keep it free from dust. Scythes may be ground up and prepared for next month's work, and hay rakes supplied with new teeth. Any tools or machines that are to be procured, should be looked after now. Consult the advertising columns for information as to the makers' and dealers' names.

Manure.—Nothing that can add to the manure pile, should be wasted. Cattle yards should be raked over, and the droppings removed to the pile every day. Let no stable manure remain scattered and exposed to the sun and rain.

Potatoes.—Early potatoes should be put in at once. Plant shallow, and earth up as soon as the sprout appears; if frost is feared, cover up in the afternoon with an inch of fine soil. Plant good sized ripe seed, and give small potatoes to the pigs.

Poultry.—Fowls will do well anywhere but in the garden. Provide coops that may be closed at night for young chickens, and keep them closed until the dew is dried from the grass. Cold and damp are the causes of more fatality among chicks, than any other evils. Young ducks are excellent to destroy insects in the garden; a hen or two cooped with broods of ducklings, will do more good in this way, than almost any other remedy, and they are self-acting.

Swine.—Hogs are scarce this season. There will be a demand for light pigs next fall, and if a good thoroughbred boar has not been secured, no time should be lost. A newly farrowed sow will take the boar in three days after pigging. She will go sixteen weeks, and pigs may be looked for in September. The pigs may be made to weigh 100 lbs. by Christmas. Spring pigs, if pushed now, and kept on good clover pasture during summer, may weigh 200 lbs. by winter. A sow is simply a farm machine for the production of pigs, and should not be kept idle, and as with other machines—keep only the best. See article on page 176.

Sheep.—Ewes with early lambs, if not to be kept for breeding, should be kept well fed, and separated from the lambs as soon as there is good grass. The lambs should have a little extra food during

weaning. Wean the lambs gradually during a week or ten days.

Sundry Matters.—If the spring clearing up has been delayed, it should no longer be put off. All earth, manure, or waste that may lie against buildings, should be removed from about the sills. In whitewashing, the sills should have a double allowance; lime is a preservative of timber. Make everything around the dairy as sweet as possible, plant vines or climbing plants for shade, and use plenty of whitewash inside and out. Don't forget the stock. Now is their harvest season, and they must repay the cost of their winter's keep. Cleanliness everywhere should be made imperative. See that no drain discharges, or any cesspool or filthy matter of any kind exists within fifty feet of the well. Rise early and go to bed early, and wash the body every night with tepid water, before retiring.

Work in the Horticultural Departments.

Spring work has come with a rush this year, and he is fortunate who has everything in readiness to meet it. March was so cold and stormy that in the northern states very little out-door work could be done before the first week in April. These notes will reach most of our readers as they are busy with plowing and planting, and as but little time can be spared for reading, such hints and suggestions must necessarily be brief and to the point. The careful manager will see that work is provided indoors for rainy days, so that there will be no excuse for hands to stand idle.

Orchard and Nursery.

Planting, except in northern localities, should be finished by the first of May, but trees which were properly heeled-in last fall can be set until the middle of the month, or later. Young trees will often be bent out of line by the strong winds which generally prevail at this season; if any are thus displaced, re-set if not too far advanced; at all events, bring them into their proper position by the use of stakes, or what is better, one or two large stones placed over the roots, which will hold the trees in place, and besides answer the double purpose of a mulch, and keep the soil under them moist. Small trees, such as should be preferred for planting, will seldom be blown out of position if properly set at first. Before dry weather comes, give a mulch of hay or straw to newly-planted trees; this will prevent much loss. Young orchards should be cultivated until the trees are of good size, and if crops are planted, use manure and keep up the land; many prefer to keep the soil plowed, even in bearing orchards. Seeding with clover and pasturing sheep is good practice.

Grafting.—If cions were cut last month, they may still be set, but do not cut them after the buds have started; rub off all shoots which start from the stock below the graft.

Root-grafts if not yet out, should be planted at once in nursery rows, allowing room enough between the rows to cultivate with a horse. Press the earth firmly around the roots to exclude air and prevent drying.

Tree Seedlings must be carefully weeded, and the soil around them loosened to encourage a quick, vigorous growth. Some need shading, especially during the first year of their growth; this is very necessary with evergreens, and may be done by a lattice work of lath, sufficiently raised from the ground to allow the air to circulate freely around the plants.

Insects.—Constant war must be made upon all injurious insects, as they appear from week to week. See last month's notes under this head.

Fruit Garden.

Strawberries.—Cultivate the soil between the rows, until the plants show signs of flowering, when a thick mulch of straw or hay ought to be given to keep the berries from contact with the earth. The few weeds which force themselves through the mulch can be easily hand-pulled.

Currants.—Plant out cuttings if not already done. Pruning should have been done long ago, but rather than leave old bushes crowded, we would even now thin out to allow the sun and air to reach the center of the bush. If the "worm" appears, use powdered hellebore; a convenient tin box for applying it is given on page 187 of this number.

Grapevines are sometimes taken from the trellises in the fall, and left covered until late in the spring, after all danger of frost is over. With those treated in this way, great care must be used in replacing them not to break or injure the young shoots if they have started. Newly planted vines should have but one shoot allowed to grow.

Blackberries and Raspberries.—Stop the growth of new canes when they are 5 feet high, and tie to stakes. All old fruiting canes ought to have been cut out in the fall. If any remain, remove them. A heavy mulch is of great benefit in keeping down all weeds and preserving the moisture of the soil.

Kitchen Garden.

So many little matters must be attended to, and so many kinds of seeds require sowing at the same time, that unless advantage is taken of every favorable day, the work will soon run behind. If labels or stakes were prepared during the winter, and seeds were provided early, the foresight will tell at this busy season. Proper attention should be given to planting for a succession; with a little care a good variety of fresh vegetables may be had during the entire growing season, from the early spinach to the latest tomatoes, sweet corn, etc.

Asparagus.—When gathering, cut from the crown or stool in order not to injure other buds. Cut clean, leaving no shoots large or small to grow until the cutting season is over.

Beans.—Plant bush sorts after all danger of frost is past. Leave Limas until the soil is well warmed.

Beets.—We give the plants of the first sowings a partial thinning, and a final thinning when the young plants are large enough to use as "greens."

Cabbage.—The early crops require the hoe and cultivator to be kept freely at work; it will tell in the extra fine heads. Set out plants from the hot-bed and cold-frame wherever there is room for them. Sow seeds in open ground for late crop.

Carrots.—Thin out as soon as up and large enough to handle. Sow seeds for winter crop.

Cucumbers.—Set out plants which have been started in hot-bed, and protect at night with boxes or glass hand-lights. Sow seeds in the open ground when it becomes warm and dry.

Corn.—This is one of the most popular of all vegetables, care should be taken to plant so as to have a succession throughout the season. Plant as soon as all danger of frost is over.

Egg Plants.—Do not set in the open ground until settled warm weather. Plants raised in hot-bed should be transplanted to other frames or potted off singly where they can be sheltered at night.

Sweet Herbs.—For directions about sowing, see last month's notes.

Leeks ought to have been sown last month, but if omitted, sow at once; thin out the plants if well up to two or three inches in the row.

Lettuce.—Keep the plants already set well cultivated; set out from hot-bed for a succession, and sow in open ground for late.

Martynia.—Sow seeds in hot-bed and transplant when the weather is warm. The green pods of this make a fine pickle, but they must be taken when very young.

Onions.—The hoe must be kept in frequent use, and hand-weeding follow, or else the weeds will choke out the young plants. Thin if too thick.

Melons and Squashes must be treated as recommended for cucumbers.

Parsley.—Sow seeds in open ground, and transplant those sown in hot-bed. The seeds require several weeks to vegetate.

Peas.—Sow for second early; see March notes. Give brush as soon as two or three inches high, and before the vines fall down. The dwarfs need no brush, and may be planted in single rows two feet apart, wherever there is room. In hoeing, earth up a little around the plants.

Peppers are of the same character as egg plants in requiring plenty of sun and heat, and should not be set out until both can be had.

Potatoes.—Hoe and cultivate the early plantings, and plant for late crop at once.

Radishes.—Sow every week or oftener for a succession. If insects appear, dust with plaster or road dust, while the dew is on.

Rhubarb.—Plants set last spring should have all their leaves to strengthen the root for next season. Keep the flower stalks cut as often as they appear.

Salsify should be sown early this month, if not already attended to, and the rows kept clean.

Spinach.—Sow seeds for the second crop. Keep the early planting well weeded and hoed.

Tomatoes.—Plant out when all danger of frost has passed, and give some support to the plants as soon as large enough to require it, and always before they fall over. A drawing of a trellis is given in the April number of the *Agriculturist*, which is both cheap and durable. If no trellis is used, brush for the vines to lie upon is better than nothing, and put down a mulch of hay or straw to keep the fruit from contact with the soil.

Turnips.—Sow seeds for second crop. The early sowings must be kept clear of weeds, and the young plants dusted with lime or plaster to prevent the attacks of insects.

Tools.—A full supply of the best made tools is indispensable in a garden, and they should be always in order. A sharp spade or hoe makes the work easier, and it is better done than with a dull one. If the steel parts are kept free from rust, they will last longer, and be much more servicable. Always see that each man puts his tools in their proper places when he stops work, and also that they are properly cleaned.

Flower Garden and Lawn.

Lawn.—This ought to be put in order at once, if not already done. Top-dress with finely ground bone, ashes, or other fertilizer that is free from weed seeds. The best time to apply guano or nitrate of soda, is just before a rain. Sow grass-seed in spots where the turf has been winter killed. Well established lawns should be mowed every week, and the grass left to protect the roots from the hot sun. For more specific directions, see last month's notes.

Flower Beds should not be planted with things from the greenhouse until the weather is warm and dry. Plants should be gradually hardened off before they are set in the open ground; this may be done by leaving the ventilators of the greenhouse, or sashes of the hot-bed, open at night, unless it is too chilly. Some of the hardier varieties of annuals may be sown or set out now.

Perennials should be divided before much growth is made. Seedlings raised in boxes, should be transplanted early, so that they may become established before the warm dry weather of mid-summer. Keep established beds free from weeds, and the soil loose around the plants. Many seedlings can usually be found around plants which flowered last season; these can be easily transplanted into rows, where they will soon make good flowering plants.

Climbers.—The woody sorts like Wistaria, Akebia, Clematis, Loniceras, etc., should be trained to their trellises or other supports, before the buds start. Sow annual sorts—Sweet Pea, Cypress Vine, Canary Bird Flower, etc., where they are to remain.

Tuberoses, in northern localities, must be started in the greenhouse or hot-bed before planting out, or else they will not flower before frost.

Dahlias should be started the same as Tuberoses, and when the buds push, divide the clumps.

Bulbs of Lilies, Gladioluses, etc., may be set in rich soil now.

Cannas do better if started before planting. They are most effective when planted in a mass on

the lawn, but even a single plant of a good variety will make a fine show.

Castor Oil Plants give a garden a semi-tropical appearance, but in order to secure an early effect, they must be started in heat, and when a foot or more high, transplanted.

Succulents if planted by themselves, will make a most effective bed during the summer, and if one has a good assortment of varieties, they may be arranged very artistically.

Hardy Ferns.—If there is a spot on the place adapted to the growth of these interesting plants, the neighboring woods and shaded banks will furnish abundant material at very slight cost.

Wild Plants.—Very beautiful wild flowers are to be found all over the country, and many of these may be removed to the home garden with a little care. They may be marked when in flower, and then taken up in the fall; if shrubs, they ought to be cut back severely, to compensate for the loss of roots in digging. With these, none, however poor they may be, if they have a bit of garden, need fail to make their homes attractive.

Greenhouse and Window Plants.

Oftentimes the entire collection of plants is removed from the greenhouse during the summer, and consequently many are lost by cold storms, or from drying winds. It is safer to keep tropical ferns, and choice tender plants generally, in the greenhouse, which should be kept attractive during the summer.

Shading must be provided either by muslin screens, or the glass must be whitewashed; in small greenhouses, the first is the most convenient.

Water and Ventilation should both be freely given, but currents of air through a house, soon dry up the soil and injures the plants, and are to be avoided.

Commercial Matters—Market Prices.

The following condensed, comprehensive tables, carefully prepared specially for the *American Agriculturist*, from our daily record during the year, show at a glance the transactions for the month ending April 13th, 1875, and for the corresponding month last year:

1. TRANSACTIONS AT THE NEW YORK MARKETS.

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
26 d's *this* m'th	242,700	601,200	1,782,000	9,000	207,000	529,000
23 d's *last* m'th	264,000	673,000	2,327,000	4,900	205,000	623,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
26 d's *this* m'th	397,000	2,910,000	2,686,000	61,000	315,000	1,763,000
23 d's *last* m'th	331,000	2,321,000	2,763,000	28,000	297,000	969,000

2. *Comparison with same period at this time last year.*

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
26 days 1875	242,700	601,200	1,782,000	9,000	207,000	529,000
24 days 1874	296,000	1,317,000	2,673,000	6,900	131,000	794,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
26 days 1875	397,000	2,910,000	2,686,000	61,000	315,000	1,763,000
24 days 1874	358,000	2,104,000	2,316,000	39,000	229,000	1,097,000

3. *Stock of grain in store at New York.*

	Wheat. bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Malt.* bush.
Apr. 9, 1875	1,701,029	2,394,967	27,531	101,961	786,260	194,771
Mar. 8, 1875	2,665,775	2,274,814	45,756	234,071	854,601	154,978
Feb. 8, 1875	3,269,000	1,408,485	50,899	266,928	915,137	137,199
Jan. 11, 1875	3,675,122	1,049,900	50,889	191,470	877,014	145,647
Dec. 7, 1874	4,513,396	1,220,973	15,925	168,391	890,899	135,622
Nov. 9, 1874	3,680,141	1,727,510	19,123	117,185	794,722	135,882
Nov. 10, 1873	1,720,338	3,133,896	22,907	232,942	755,153	82,674

4. *Exports from New York, Jan. 1 to April 10.*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.
1875	491,415	4,036,892	3,249,570	33,063	90	33,084
1874	612,380	7,330,021	3,048,833	254,810	—	39,934
1873	296,843	1,050,712	3,182,533	1,004	11,830	6,163
1872	217,604	1,873,515	3,579,949	179,320	—	8,730

Gold has been up to 117, and down to 114¼, closing April 12th at 115¾, as against 115¾ on March 12th..... A much improved demand has been noted for the leading kinds of domestic produce, since our last, at generally stronger prices. The export movement has been more liberal, chiefly in shipping grades of flour, spring wheat, and mixed corn. Considerable speculative inquiry has been reported toward the close for wheat, corn, oats, and hog products....Flour has been freely purchased at advanced rates. The dealings in wheat, corn, and oats have been extensive, with values closing very firmly. Barley has fluctuated widely, and left off heavily. Rye has been scarce and wanted at quoted rates....In the provision line, hog products have shown unusual activity and buoyancy. Beef firm, but quiet. Butter in rather limited demand, and quoted lower. Cheese steady and moderately active. Eggs unusually variable as to price, on a less satisfactory trade....Cotton has been quite active, but irregular in price, closing in favor of buyers....Wool has been quoted steadier on the later dealings, which have shown more animation....Hops, hay, straw, and tobacco have been moderately sought after within our range.... Seeds have been in better request, especially clover, which closed stronger in price.

CURRENT WHOLESALE PRICES.

	Mar. 13.	April 13.
PRICE OF GOLD	115 3-4	115 3-8
FLOUR—Super to Extra State	$4 40 @ 5 85	$4 60 @ 6 00
Super to Extra Southern	4 60 @ 7 50	4 60 @ 8 00
Extra Western	4 90 @ 8 00	5 00 @ 8 25
Extra Genesee	5 25 @ 6 50	5 40 @ 6 75
Superfine Western	4 40 @ 4 90	4 60 @ 5 00
RYE FLOUR	4 00 @ 5 10	4 25 @ 5 25
CORN-MEAL	3 50 @ 4 75	3 90 @ 4 80
WHEAT—All kinds of White	1 25 @ 1 35	1 30 @ 1 42½
All kinds of Red and Amber	1 07 @ 1 27	1 15 @ 1 32½
CORN—Yellow	85½@ 86	94 @ 96
Mixed	84½@ 86	93 @ 95
White	85 @ 86	94 @ 96
OATS—Western	65 @ 70	72 @ 77
State	66 @ 70	73 @ 77
RYE	90 @ 96	95 @ 1 07
BARLEY	1 00 @ 1 32½	1 15 @ 1 50
HAY—Bale, ₱ 100 lbs	60 @ 1 00	65 @ 1 05
STRAW, ₱ 100 lbs	50 @ 85	50 @ 85
COTTON—Middlings, ₱ lb	16¼@ 16¾	16¾@ 17
HOPS—Crop of 1874, ₱ lb	28 @ 42	28 @ 45
FEATHERS—Live Geese, ₱ lb	35 @ 65	33 @ 55
SEED—Clover, ₱ lb	11 @ 11¾	11¾@ 11¾
Timothy, ₱ bushel	2 80 @ 2 90	2 55 @ 2 85
Flax, ₱ bushel	2 20 @ 2 30	2 10 @ 2 35
SUGAR—Refi'g & Grocery ₱ lb	6¾@ 9¼	7 @ 9¼
MOLASSES, Cuba, ₱ gal	35 @ 45	40 @ 45
New Orleans, ₱ gal	60 @ 70	65 @ 77½
COFFEE—Rio (Gold)	16¾@ 18¾	15¾@ 18¾
TOBACCO, Kentucky, &c., ₱ lb	10 @ 28	10 @ 28
Seed Leaf, ₱ lb	7 @ 55	7 @ 55
WOOL—Domestic Fleece, ₱ lb	27 @ 62½	30 @ 64
Domestic, pulled, ₱ lb	26 @ 50	30 @ 50
California, clip	16 @ 37	15 @ 34
TALLOW, ₱ lb	8 @ 8½	8½@ 8¾
OIL-CAKE—₱ ton	44 00 @47 50	45 00 @47 50
PORK—Mess, ₱ barrel	19 50 @19 62½	22 25 @ — —
Prime Mess, ₱ barrel	18 00 @ —	19 75 @20 00
BEEF—Plain mess	9 50 @10 50	10 50 @ — —
LARD, in tres. & barrels, ₱ lb	13¾@ 14¼	15 @ 15¾
BUTTER—State, ₱ lb	19 @ 35	15 @ 30
Western, ₱ lb	15 @ 32	12 @ 25
CHEESE	6 @ 17	5 @ 16¾
BEANS—₱ bushel	1 55 @ 3 15	1 50 @ 3 00
PEAS—Canada, free, ₱ bu	1 18 @ 1 28	1 15 @ — —
EGGS—Fresh, ₱ dozen	32 @ 35	25 @ 26
POULTRY—Fowls	15 @ 24	15 @ 24
Turkeys—₱ lb	15 @ 21	16 @ 22
Geese, ₱ pair	1 25 @ 2 00	1 25 @ 2 00
Ducks, ₱ pair	50 @ 1 25	70 @ 1 12
PIGEONS, ₱ pair	— @ —	75 @ 1 00
WILD DUCKS, ₱ pair	75 @ 1 75	50 @ 1 25
HARES, ₱ pair	40 @ 50	— @ —
RABBITS, per pair	35 @ 40	— @ —
TURNIPS ₱ bbl	1 37 @ 1 75	1 25 @ 1 75
CABBAGES—₱ 100	8 00 @11 00	5 00 @11 00
ONIONS—₱ bbl	2 50 @ 3 50	1 75 @ 4 00
POTATOES—₱ bbl	1 75 @ 2 75	1 62½@ 2 50
SWEET POTATOES—₱ bbl	3 00 @ 4 00	3 00 @ 3 75
BROOM-CORN	9 @ 15	10 @ 16
APPLES—₱ barrel	1 25 @ 2 00	75 @ 2 00
CRANBERRIES—₱ bbl	2 25 @ 9 50	2 25 @ 9 50
GREEN PEAS, ₱ bushel	1 90 @ 2 10	2 20 @ 2 50
GREEN PEAS, Florida, ₱ crate	— @ —	6 00 @ —
TOMATOES, ₱ crate	— @ —	2 50 @ —

New York Live-Stock Markets.

RECEIPTS.

WEEK ENDING	*Beeves.*	*Cows.*	*Calves.*	*Sheep.*	*Swine.*	*Tot'l.*
March 22	8,460	124	623	19,300	21,000	49,507
March 29	7,486	159	1,033	22,633	26,091	57,405
April 5	7,660	102	1,075	11,911	26,412	47,160
April 12	8,550	124	1,904	18,734	22,300	51,602
Total for 4 Weeks	32,159	509	4,635	72,568	95,803	205,674
do. *for prev. 5 Weeks*	35,925	502	3,247	109,261	130,305	279,240

	Beeves.	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Average per Week	8,040	127	1,159	18,142	23,950
do. do. *last Month*	7,185	100	619	21,852	26,051
do. do. *prev's Month*	8,456	107	697	23,870	31,986

Beeves.—An advance of ¼c. ₱ lb., at the beginning of the past month's business, and a continuously firm market, has been no help to sellers. On the whole, business is not satisfactory. Beeves have been sold here at 11c., to dress 57 lbs. ₱ cwt., which cost 6¼c. alive in Chicago. The losses to drovers have in some instances amounted to $50 per car-load. The scarcity of corn in the west makes the comparatively high price of cattle there of little benefit to feeders, and just now the consumers alone reap the advantage. This state of things may not last, for the market closed firm, with owners of cattle anxious for an advance, and hopeful of getting it. Fancy selections sold at the close at 13½c. @ 14c. ₱ lb., to dress 53 lbs. for a few, but the bulk went at 13¼c.; 10¼c. to 13¼c., was the quotable range for corn-fed natives. 2,000 still-fed cattle arriving at this premature season, has kept the market for thin cattle very dull.

The prices for the past four weeks were as follows:

WEEK ENDING	*Range.*	*Large Sales.*	*Aver.*
March 22	9¼@14 c.	11 @11½c.	11¼c.
March 29	9 @14 c.	10¾@11¾c.	11 c.
April 5	9 @14 c.	10¾@11¾c.	11 c.
April 12	9 @14 c.	10½@11½c.	11 c.

Milch Cows.—Cows have dragged heavily through the month, and lessened receipts alone will help the market, which closed dull at $50 to $80 for ordinary to choice milkers. Fancy cows bring $90 to $100 with calf included....**Calves.**—The market for veals has been brisk at good prices. The receipt of 1904 the last week, against 1075 the previous week, weakened prices a little, but trade closed very active. Common to prime, sold for 6c. @ 10c. ₱ lb. Milk fed veals and buttermilk calves, brought 5c. @ 5½c. ₱ lb., and "bobs" were worth $1.25 to $3.25 per head....**Sheep.**—The market for sheep closes fair, after a steady business at full prices; common to extra, sold at 6½c. @ 8½c., and 5½c. @ 6¾c. for clipped. The latter are slow of sale, and need forcing to go off. Spring lambs were sold at $7.25 per head....**Swine.**—The light receipts have advanced prices to 10¾c. @ 10¾c. ₱ lb. for city dressed. The business closed firm and active with no live hogs on the market, all arrivals being consigned to slaughterers.

Large Pay

for a little work is very agreeable. But thousands are letting an opportunity to get *large pay* pass by unimproved. No one can look through our Premium List, without finding many *good* things—things that are worth far more than the selling value set against them. This List is a handsome illustrated sheet of eight pages, is sent *free* to all applicants, and there is not an article mentioned in it, which it would not pay well to purchase with money. But we put it in the power of those who can not spare the money, to secure one or more desired articles without cost. Many thousands have done so recently, and many other thousands can yet do the same thing

During May.

A few odd hours—spent in collecting a small number of names—will secure an article worth many dollars. Ladies are usually successful canvassers, and a number have secured first class pianos. One lady first got a beautiful Tea Set for herself, and then earned another for a friend. Sewing and Knitting Machines, Wringers, Washing Machines, first-class Watches, etc., etc., have been taken in great numbers. It can quite as easily be done

This May

by thousands of those who have premium clubs partly filled already, and by any number of others who will start *new* premium clubs. There are very few Post-offices where there are not still people enough to make up a premium club—persons, too, who would be *greatly benefited* as well as pleased by having this journal properly brought to their attention. The five beautiful and valuable numbers of this volume now issued, are to be followed by seven others—as much better as it is possible to make them. Will anybody fail to get back the value of his subscription money, many fold?

Reader,

here is a chance for you. Try your hand at getting a small club, at first, for some one of the premiums of moderate value, even if it be one of the smallest ones in the table. You will be quite likely afterwards to make it larger before sending for the premium; and if you do not, the few names secured, and the experience gained, will open the way for a splendid premium club next season.

Did It Pay?—Thirty-three years ago two farmers settled side by side, with about equal advantages as to soil, markets, etc. One of them subscribed for the *American Agriculturist*, and occasionally bought a book or two about his business, the whole costing him only $6 a year. His boys read and *thought* about their work, became interested in and *respected* it, and were happy in their toil, because they had something to think about. They grew up intelligent, and settled as good prosperous farmers, respected and influential....The other farmer "couldn't afford papers and books"; (he could afford 6 cents a day, or $20 a year, for tobacco, beer, etc.) His boys worked sullenly by day, and "skylarked" at night; they despised and hated their work, which for them was only exercising brute force, with little mind applied. When old enough to escape parental restraint, they quit the farm, one for this, and another for that, and *none* of them ever amounted to anything. Six dollars a year, or even $1.50 a year, would have made a wonderful difference—would have changed their whole course of life. Would it have paid?... Please show this item to some of your neighbors, who have perhaps not thought of this matter, and invite them to try this or some other good journal for the present year. You may do them a positive good by such a hint.

Two Months More

FOR PREMIUMS.

May and June are good months in which to fill up club lists of subscribers already begun, or to **make up new clubs, and secure a Premium.** The List will not be withdrawn until July 1st. There will be found upon this Premium List for the year 1875, a large number of most useful and valuable articles, all of which are new and of the best manufacture, and any of which can be obtained *without money* and with but a little *well directed effort*. Among these are: **Beautiful Silver-Plated Articles — Fine Table-Cutlery—Gold Pens with Silver Cases—Children's Carriages, Swings, etc.—Watches—Pianos — Melodeons — Pocket-Knives — Guns—Cultivators—Sewing, Knitting, and Washing Machines—Books, etc., etc.**—Send for our Illustrated Premium List, and see how easy you can obtain one or more of these good and desirable articles.

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of room elsewhere.

Remitting Money: — Checks on New York City Banks or Bankers are best for large sums; make payable to the order of **Orange Judd Company. Post-Office Money Orders** for $50 or less, are cheap and safe also. When these are not obtainable, **register** letters, affixing stamps for postage and registry; put in the money and seal the letter in the presence of the postmaster, and *take his receipt for it.* Money sent in the above three methods is safe against loss.

☞ **N.B.—The New Postage Law.**—On account of the new postal law, **which requires pre-payment of postage by the publishers, after January 1st, 1875,** each subscriber must remit, in addition to the regular rates, **ten cents for prepayment of postage by the Publishers, at New York, for the year 1875.** Every subscriber, whether coming singly, or in clubs at club rates, will be particular to send to this office postage as above, *with his subscription.* Subscribers in British America will continue to send postage as heretofore, for pre-payment here.

Bound Copies of Volume Thirty-three are now ready. Price, $2, at our office; or $2.50 each, if sent by mail. Any of the last eighteen volumes (16 to 33) will also be forwarded at same price. Sets of numbers sent to our office will be neatly bound in our regular style, at 75 cents per vol. (50 cents extra, if returned by mail.) Missing numbers supplied at 12 cents each.

Our Western Office.—Our friends in the West are reminded that we have an office at Lakeside Building, Chicago, Ill., in charge of Mr. W. H. Busbey. Subscriptions to *American Agriculturist* are taken there, and sample copies of the paper and chromo are delivered, and orders received for advertising on the same terms as in New York. All our books are on sale at the Western Office. Please call and examine, buy, subscribe, and advertise.

Lakey's Village and Country Houses.—This new and elegant work contains 56 designs in 84 plates, giving plans, elevations, perspective views and details of a great variety of buildings; from the simple laborer's cottage with two rooms on a floor, to the large sea-side or other villa. There is not only a wide range in the size of the buildings, but a great variety of styles, and one must be very fastidious not to find something here to please him. We are glad to see on paper what we would like to see more of in reality; houses in the construction of which the rough stones of the fields are largely used. Some churches and schoolhouses are given, and add to the utility of the work. Published by the Orange Judd Company. Price $6.

Trustworthy.—There is no doubt that, taken as a whole, no more trustworthy collection of business announcements was ever found together, than those that fill up the advertising pages of the *American Agriculturist.* One of the oldest and largest advertising Agents, who has to do with all the newspapers of this country, recently remarked: "No other journal, religious or secular, has for a long series of years been so persistently strict in shutting out objectionable, or even questionable advertisements, as the *American Agriculturist.* We hardly dare promise to insert any advertisement in that paper, no matter how good it is, until we have had it examined by the editors, to see if it don't have something objectionable in it. It's no use trying to get any medical advertisement in for love or money."—The publishers and editors are proud of such a statement from such a source, as it indicates the possession of a reputation they desire to be worthy of. Though they may once in a thousand times be themselves deceived in parties, they earnestly try not to be. They mean to protect *their* readers, in the business as well as in the reading columns. They also wish their readers to let advertisers know that they have a right to expect good treatment, and to secure this, it is enough to simply say, when writing to advertisers, in ordering, or sending for circulars, etc., that you read their advertisement in this journal.

High-Priced Sticks.—Some time in March Mr. Roezel, the well-known plant-collector, consigned 52 plants of a rare cycad, *Zamia Roezelii*, from Buenaventura, to Young & Elliott, Seedsmen of New York. To an ordinary observer they looked like pieces of rotten wood, but when Mr. Elliott offered them at auction, a spirited competition showed that they were "diamonds in the rough," for the smallest "chips" brought 50 cts., while larger "logs" of 18 inches in length brought $36.00 each. Mr. George Such, of South Amboy, N. J., was successful in monopolizing the rare lot, except one specimen. The aggregate value of the 52 plants was $405. They were bought mainly for exporting to Europe, where plants similar to these have commanded at retail two hundred guineas each.

The Bogardus Mill.—Numerous inquiries as to where this mill may be had, will find an answer in our advertising columns.

The Colorado Horticulturist.—A quarterly of 16 pages, published at Greeley, Col., and edited by J. F. Foster, at the low price of 50c. a year. If anything in respect to the rapid progress of "the west" could astonish us, it would be to receive a horticultural paper from a place like Greeley, which but a few years ago was unbroken prairie. Only the first number has come to our notice, but in this the editor shows good sense. Most new papers of this kind, make the great mistake of publishing articles on wonderful things abroad, or those discussing matters, interesting enough in a scientific point of view, but of no possible use to their readers. The Cororado editor wisely gives prominence to local matters, and shows that he intends to make his paper what its title indicates, the *Colorado* Horticulturist; he wisely sees that to tell his readers, as he does in this number, that certain cabbages do not succeed in Colorado, is of more value to his readers than an account of the Crystal Palace at Sydenham.

Hulless Oats.—"H. S." There has been in cultivation since very early times an oat known as skinless and naked, and in some parts of England as "peelcorn," and we suppose, from the name only, as we have not seen it, that the "Hulless oat" is the same thing. It is regarded as a distinct species (*Avena nuda*) from the common oat, (*A. sativa*), from which it differs in having 3 or 4 flowers (and grains) in the spikelet, while that has but 2. In the common oat the palets of the flower enclose and closely surround the grain when ripe, forming the hull; in the other the grain is not thus surrounded, but free. In some parts of Europe, especially in Ireland, this oat is much cultivated for making oat-meal. It was tried in this country many years ago, and is offered every now and then as something new and wonderful. So far as we are aware it has always degenerated; had it been of any practical value, it would have kept its place among the generally cultivated grains. You ask if this oat is a "humbug." So far as there being such an oat, no; but the claims made for it are such as we are quite confident experience will not sustain, and as to paying a dollar a pound for a grain that is so common abroad as this is—if people do it, it will not be by *our* advice.

Mowing-Machine Knives.—The effect of a dull knife is to increase the labor of cutting grass 25 per cent. With a dull knife half of the force of one of the horses of a team is totally lost. In a day's work this loss equals the cutting of two acres of grass. In fact two acres more of grass a day may be cut in a day with sharp knives than without. Five minutes work twice a day with a good hand-sharpener will keep the knives in good condition. The "rhomboidal harvester sharpener" made by Youse & Co., of Bryan, Ohio, fits the knives of a mower exactly, and sharpens them perfectly. It is held in the hand just as a "rifle" or whetstone for sharpening a scythe, and may be used while the team is resting.

Moss and House Plants.—Mrs. G. R. Percy. If the soil is in proper condition, no harm will be likely to come from covering the surface with moss from the woods. The soil of house plants often becomes what the gardeners call sour, from being too compact, and the drainage imperfect or lacking altogether.

N. Y. City Suburban Homes—Cost of Reaching Them.—The number of people residing in the country or neighboring villages, who go to New York City daily to engage in business for themselves, or others, is very large. There are at least a dozen Railroads that furnish good and rapid facilities and commutation tickets. In comparing the rates on these railroads, we find the average cost of travel, allowing the commuter to go each way 300 times a year, to *average* about as follows for each mile traveled. Those residing 10 miles from the city pay 1 cent per mile. Those living 20 miles distant, pay $6^5/_6$ *mills* per mile. At 30 miles miles distant, $5^1/_3$ *mills* per mile. At 40 miles distant, $4^3/_4$ *mills*, and at 50 miles distant, $4^2/_5$ *mills* per mile.

Book on the Horse.—"A. C.," New Haven, Mo. Dadd's Reformed Horse Doctor, will be found a very useful book for any one who keeps a horse; it treats on the management of a horse, its anatomy, its diseases, and the treatment and medicines proper for them. The price is $2.50.

"Thoroughbred," and "Full Blood."—"J. F. L." There ought to be no distinction between these terms, they mean the same thing. Either means the progeny of animals on both sides, that are accepted as thoroughbred, and are entered in the various herd books. Animals may be entered in the English Short-horn Herd Book, that have four crosses, that is, that are descended directly and consecutively for four generations, from herd book or thoroughbred bulls, but in this country such stock would be considered only as high grades, or having fifteen-sixteenths of full blood. They are not in reality full blood, and how many crosses constitutes a full blood, has not yet been settled here.

Hints about Work.—Scores of enquiries as to matters about the farm, orchard, and garden, are answered in the hints about work, given in the *Agriculturist* every month. These "hints" are very carefully studied, and are intended to include all the important work to be done in the month. In the present month will be found information about rolling ground, barley, oats, fodder-crops, and many other matters in relation to which we have many letters now before us, and to which we can not give separate replies.

How to Grow Flax.—"J. B. B.," Mapleton, Kansas. Flax is a good crop for rich bottom lands. When grown for seed, one bushel per acre is enough, as it then branches and yields more grain. It should be sown as soon as danger from frost is over, and may be harvested with the reaper when the seed-bolls begin to turn brown. It may be threshed in the ordinary machine, and cleaned in a sieve made purposely for it. There is no more labor about it when grown in this way, than with a crop of oats. It leaves the ground in good condition for fall wheat.

Apple Pomace for Manure.—"E. W. S." Apple pomace is not worth anything as manure until it is thoroughly rotted. It is then worth about as much as ordinary swamp muck.

Make Home Beautiful.—Read the advertisement on third cover page of this number, "Beautiful Pictures, and How can I get one of them?"

Effect of Food upon Milk.—"J. S. C." If one would think but for a moment, there would be no need to ask if a cow well fed will produce more butter than one poorly fed. The butter comes from the food and nothing else, and the better the food, the richer the milk. Read the articles on "Science Applied to Farming," in the *Agriculturist* for the present and the past four months, for valuable hints on such matters.

Floor for Basement of a Barn.—"S. L. R." A cement floor for a barn basement, is preferrable to a plank floor. It is cleaner and harbors no vermin. A paved floor is described in the *Agriculturist* of November, 1873, which we have found to be the best for this purpose, as it is clean and permanently durable.

The Value of Timber Lands.—"Amateur." There is a large scope for profitable settlement in the timber lands of Michigan, for those who do not dislike the labor of clearing the land. Timber is now so valuable that in almost any locality it can be sold for enough to pay the cost of clearing and fencing. A new beginner could not expect to cut more than half a cord of wood a day at first, he will soon be able to cut one to two cords a day if he is industrious, and the wood is of fair quality. The best crops at first are wheat for two years, and then grass until the stumps rot out.

Ventilation of Stables.—Proper ventilation does not consist in wide cracks in the doors, nor holes in the walls, which let in a stream of cold air upon the animals. Unless there is ample space above, to allow the impure air to escape, the stable is filled with eddies and currents below, which are injurious to cattle. Ventilation should be by means of many small spaces, which admit numerous small streams of fresh air. If there is an open space above the cattle, these small streams intermingle without causing any perceptible draft of cold air. Proper ventilation consists in having the air within in exactly the same condition as it is without; pure, fresh, abundant in quantity, and equal in quality, so that the air that the animals breathe is as pure as that which flows about their feet and legs.

Stray Cattle.—"W. W." If farmers or stock men would use the ear marks or labels made by C. H. Dana, of West Lebanon, N. H., which cost only 5 cents each, there would be no stray cattle lost. These labels may be stamped with the owner's address, and being of metal, will not wear out. Cattle bearing these labels, carry their owner's name and address wherever they go, and the fact of their straying can be sent to him by a letter or postal card.

Windmills.—"J. G. P." The best windmill we know of, is that made by the United States Windengine Co., of Batavia, Ill. They are made of all sizes up to those powerful enough to work two or more sets of mill stones.

Jerseys for Cheese.—The Winthrop, (Maine), cheese factory, during a season of 83 days, averaged only 8.07 lbs. of milk to a pound of cheese. The milk was chiefly that of Jersey and grade Jersey cows. The cheese was also of high quality. We have heard of no other factory that averaged much less than 10 lbs. of milk to a pound of cheese. The three best cows whose milk went to this factory, were pure Jerseys, and yielded from 35 to 37¼ lbs. of milk per day. It has been generally supposed that Jerseys were useless for the cheese dairy, but this success will doubtless encourage other tests.

Color of Ayrshires and Alderneys.—"P. L. F." Alderneys and Jerseys are distinguished from Ayrshires, by their slighter form; a fawn or mouse color, either solid or mixed with white; slender horns; black or mealy muzzle, with a yellowish ring around it, and around the eyes; large eyes; slender neck and deer-like head; while Ayrshires are generally white and red, larger in the body, coarser in the horn, neck, and head, and white about the muzzle.

Salt or Plaster.—"J. W. K.," Ontario. It is doubtful if salt is of much use except under special circumstances, which can only be discovered by experimenting. Plaster is far more widely useful, and should be used on peas in preference to salt.

Adulteration of Cheese.—Nothing is more surprising or more censurable than the recent attempts at some of the Dairy Conventions, to familiarize dairymen with the knowledge that cheese may be adulterated with a preparation of tallow. There is scarcely anything made that may not be adulterated, if it is not already. The substance known as oleo-margarine, which is simply the liquid part of animal fats or tallow, is mixed with skimmed milk, and a cheese made from the mixture which competes with honest cheese from the whole milk. The knowledge of this fact should be sufficient to raise a united protest from all dairymen, against the sale of this stuff as a dairy product. The simple knowledge that such a compound is made, must put consumers of cheese on their guard, for they well know that if cheese is now adulterated with tallow, the tallow in its turn will soon be adulterated with something cheaper yet, and this may be the product of rendering establishments where dead horses and offal are worked into grease. Then no one will eat cheese, and the dairymen will have killed their business for the sake of a few dollars. The true course for the dairymen, is to procure a law to compel such cheese, and what is known as butter made from this stuff, to be sold under distinct and conspicuous brands, which shall represent exactly what they are. It is to the interest of the dairymen, who must suffer seriously from this competition, to do this. Those leaders of this industry, who have so far been misled as to give an endorsement and favorable opinion of the manufacture of sophisticated cheese, will surely regret it when the inevitable injury to their business begins to be felt. Food must be above suspicion of adulteration, and to unguardedly announce to the world, the fact that adulteration is not only easy and cheap, but advisable, is one of the greatest possible mistakes. We are glad to notice that the Ohio, North Western, and Maine Dairymen have set themselves in opposition to skimming milk for cheese, and of course these are not the men to bring oleo-margarine into their dairies.

Tar for Shingle Roofs.—"S. P.," Dutchess Co., N. Y., says in 1834 a shingle roof that had been laid in 1803, became leaky, and was treated to a coat of boiling hot tar, with a common broom, and then sanded. The roof is now in good order.

Poultry Diseases.—Gapes, cholera, and other diseases of fowls, are caused solely by want of cleanliness, by dampness, improper food or water, ill ventilated houses and vermin. Fowls can not take care of themselves, even if supplied with unlimited food, but will become affected with all those ills that all wild fowls. But with skillful management they may be kept for years without any disease whatever. Fresh ground is necessary to cleanliness.

Paints for Tools.—"G. W. S.," Ulster Co., N. Y. White paint is simply white lead ground in oil, and when used diluted with boiled linseed oil, until thin enough to spread well. If a dead white is wanted, turpentine is used in place of the oil, or equal parts of each. Colored paints are made with white lead for the basis, and sufficient red lead or venetian red for reds, Prussian blue for blue, Brunswick or chrome green for dark and light green, and raw or burnt umber, or raw or burnt sienna for the various browns. These are added to the white lead in sufficient quantities to make the required color. For outbuildings and tools, crude petroleum, costing 15 cents a gallon, will make a dark brownish color, which is not unsightly, and is a good preservative, but it is not a paint.

SUNDRY HUMBUGS.—As we look over the budget of humbug documents, it seems surprising that people are content to plod along year after year, the majority getting scarcely more than a living, when there are so many ways by which one can get rich at once, by making a very small investment,

THE AVENUES TO WEALTH

here pointed out are so many that one is puzzled which to take, as each promises to be shorter than the other. He must be a poor fellow who cannot raise the few dollars required to pay the toll. If farmers will be so foolish as to follow farming, why do they not get some of the wonderful wheat and oats, the compound to make butter, and the fruit-growing stuff; and as for a long life, if that is desirable, or if one wishes health while he does live, here are no end of remedies. Long life, health, wealth, profound knowledge, and many other desirable things are offered, and *if* the statements are true, within easy reach of all.

"THERE'S VIRTUE IN AN IF."

There is nothing new in all these things; the same hopes of easy acquirement of wealth, health, and other desirable things were held out before any of us were born, and if reference be made to our humbug articles of ten years ago, it will be seen that precisely similar inducements were offered then, though under different forms and names. A reference to the earlier records will show another thing,—that none of the enterprises apparently so flourishing then, are in existence now, with the exception, it may be, of a very few medical humbugs. That these things should in one form or another be always before the people, is explained by the melancholy fact that there is always and everywhere a large class who are not only willing, but desirous to be humbugged. It is one of the strange phenomenon of human nature, but it is as true that certain men are constitutionally gullible as it is that others are naturally shrewd. It is upon this gullible class that these various swindling enterprises subsist; and upon these we do not expect our exposures of humbugs will have the slightest effect. If swindled by one scheme, they are just as ready for another. Strange as it may seem, there are men and women who pass their lives in trying one quack medicine after another, and that they still live is strong evidence of the general inertness of these compounds. We have no hope of changing these confirmed cases, but our aim is to warn the unsuspecting, those who, guileless themselves, do not distrust the motives of others; the young whose imagination being excited by plausible statements do not sufficiently reason upon them as to see the impossibility of their truthfulness; and those who by adversity have been brought into that desperate state of mind that leads them to catch at anything, however wild and improbable, that promises relief. It is to these and to similar classes that our warnings are addressed, and the many assurances on all sides that our exposures have been of the greatest benefit, especially in rural communities, induce us to continue in the course that the *Agriculturist* was the first to adopt, and expose the numerous swindling schemes however small they may be; indeed it is really more important to our readers that they should be warned against the minor swindles than the larger ones, which can only defraud capitalists. As an illustration of the many schemes for

MAKING MONEY EASILY,

a catalogue now before us is a good illustration; it is published in that flourishing manufacturing place, Newark, N. J., but as we do not advertise this kind of trash, we do not say by whom. It is a "Catalogue of Books and valuable Money Making Discoveries." Here is a "Book of Secrets" which is a "complete guide to wealth," which will teach any one to make $3,000 to $10,000 a year. If one doesn't fancy that, he can get the "New Secret Art of Making Money whereby $5,000 to $10,000 can be made annually, or if artistically inclined, '$1,000 every month' can be made by the great English Art of Making and Drawing Oil Paintings." But these and others are nothing to "The Greatest Discoveries of the Age—Pays better than a Gold Mine. $1,000 to $3,000 per day"!!! "An easy, certain, and quick way to get rich within the Reach of All," and it all costs only $6. The business is one that perhaps every one would not like to engage in, as it is the making of artificial brandy, whiskey, and other things which are bad enough in their pure state. No doubt these books have a considerable sale, and it never occurs to those who buy the "secrets" to make money readily, that if they had really any value their possessors would not part with them at a dollar a bookful, up to $6, for the liquor stuff. Selling these books cannot be so very remunerative—certainly nothing like the $1,000 to $3,000 per day which they assure others can be made by preparing, what is in the slang of the day called "rot-gut" and "40-rod whiskey."....In the spring we always expect a set of humbugs expressly to

CATCH FARMERS AND GARDENERS,

and we have a few at this time, though probably because it is a backward season they are not so numerous as they sometimes are. Among these the "compound" for making butter at 4c. a pound seems to be perennial. The amusing thing about this circular is the claim that the "compound" is the result of a scientific discovery, while science teaches very plainly that there is only just a given quantity of butter in a pound of milk, and no hocus-pocusing will get any more from it....All insects are hereby warned that their lives are short, as a man in Ohio has gone and invented a "Socotra Insect Destroyer and Tropical Fruit Producer," and he tells how to do it for $2, only you must sign "a bond" not to divulge, and all that, as the "right to this discovery is absolutely secured to me by law." Now, Mr. insect man, what do you mean by that? The stuff isn't patented, if it were, every one who chose could get a copy of the patent by paying the usual fee; so what is the use of talking about the "law." We advise no one to invest in any preparation for destroying insects unless it is backed up by well known names. In Ohio there are many well known fruit-growers whose endorsement would carry great weight. We know nothing about this man's "destroyer," but we think his circular and its talk about the "law," deserves a place among the humbugs....There are as usual several seeds offered with the most

HIFALUTIN DESCRIPTIONS,

and this is a class of subjects that it is very difficult to treat properly. For instance, there is a [so-called "Japanese pea," widely advertised, and in some instances the most extravagant claims made for it. The pea itself is, to begin with, nothing new, and as to its being "the finest pea grown for the table," that is simply bosh. Were this a good table pea, the small size of seed and pod, and the hairiness of the pods would be serious objections. Still the pea produces a great amount of forage and grain, and no doubt will be found useful in some of the southern states, to grow for feeding stock. In this case the article evidently has some merit, and we can not properly place it among the humbugs, but use it to show how a plant that in certain localities may be valuable, is injured by inconsiderate advertising....Japan is prolific in wonders; here is the "Mammoth Japanese Seed Corn." We have not seen this corn, but when we read among its claims to superiority over other varieties, "This corn will yield from twice to three times as many bushels to the acre, on the same soil and with the same culture," we think we will wait a bit....Then there is a new corn that claims to have come—of all places in the world—from the Isle of Wight, where they know as much about Indian corn as an Esquimaux does of pine-

apples, and what makes the matter more absurd, is that while it is claimed as superior for *mealing*, people are advised not to buy Crosby's, Moore's Concord, and other well known varieties of *sweet corn*, but get this Isle of Wight thing instead. That is rather more than people who know anything about sweet corn can swallow. These things are offered every year, and many persons invest a dollar in them just out of curiosity, and if they can afford it, we have no doubt they get their money's worth of fun out of the investment; the great harm they do is among those who test a novelty for the first time, and when they find the extravagant claims not sustained, they conclude every new thing must be a humbug, and will not try a really good thing when it is offered. Our seedsmen, nurserymen, and florists, are always on the lookout for every good and new thing, and stand ready to pay enormous prices for every novelty worth having, and it is safe as a general rule, when wonders among fruits, flowers, and vegetables are offered by peddlers, or by people in obscure villages, to wait until they have been sufficiently tested to get into the general trade.

THE CHEAP SEWING MACHINES

did not all expire with the celebrated Mulligan.—By the way, we are glad to learn that some who sent money to M., received it back from the dead letter office.—It looks as if Mulligan had more than one successor, and inquiries continue to come about cheap machines. What can we do except what we have already done?—advise our friends to go slow. Take this for an example. An inquiry comes about a cheap machine that we have not before heard of. A representative from the *Agriculturist* goes to the number. After some trouble in mounting the stairs, he finds the place to be two obscure upper rooms; one room occupied by a girl writing, with a great many envelope boxes in sight, but no machine. Upon a machine being asked for, the envelope boxes, which cover a box in a corner, are taken off, and a fair looking machine, apparently the only one in the establishment, taken out. Now we can not denounce these parties by name as humbugs, but the whole thing looks—well just like such a place as we would not go to to buy a machine. There are several concerns, advertising freely in papers a long way off, but not at all in those at home, that seem to be first-rate places to fight shy of. We have an eye on them, but must wait for evidence before we call names. Remember Mulligan, and be cautious!

THE LOTTERY HUMBUG,

in its different forms, seems just now to be confined to Wyoming and Texas, the state last named having three of these gambling schemes on hand at once; but then Texas is a large state. One of the Texas schemes went to a friend in Missouri, who took the trouble to calculate the chances, and concludes that as it takes a dollar to pay the managers for putting each dollar into the hands of the winners of prizes, the chances of the game are too much on the other side. If every one would investigate the absurdity of these schemes, there would be fewer tickets sold, though we would prefer that all should avoid them because they are wrong. That member of the firm of Egerton & Co., lottery dealers, Camden, N. J., is still dreaming that so and so have drawn prizes; we are afraid the fellow eats late suppers, or he would sleep more quietly.

COUNTERFEIT MONEY ENTERPRISES

seem to be about played out; they have been so thoroughly exposed by us ever since they started, and within a few years by the daily papers, and the law is so strict and so well enforced, that the operators stand a poor chance. Now and then one issues his circulars from some out of the way place, but he does not continue at it long; it is a game only successfully played in large cities. There is a fellow at Rumsbarger, Pa., who is either

A FOOL OR A KNAVE,

we are not quite sure which: Here is his letter,

"Mr. Orange Jud & Co. Dear Sir i would like to know where i could get some bogas money and what it is worth and how soon i could get it i have a good chance to shove it i would want about one hundred and in 5 2 and 1 and as few a fives as posable. Yours Truly Direct to Curtis Reid Rumsbarger Clearfield Co. Pa."—There Curtis is your letter, if you like the looks of it in print we are glad of it. You are either a rascal who wants "bogas" money, or a fool who has written under an assumed name to see what we would say, probably the last, and we hope that by the time you see this, you will not feel annoyed at being pointed out as the man liable at any time to be arrested for using the U. S. mails for unlawful purposes. Are you not ashamed of yourself, Mr. "Curtis Reid"?

MEDICAL MATTERS

Are just a little livelier than they were, as we get now and then a novelty; still we don't think the business can be flourishing, for some of the dealers are trying the black-mailing dodge. One of the diamond-wearing, many named New York quacks is trying this game in Florida, and we venture to hope that he will find that climate does not agree with him. There is a chap in Pittsburgh, Pa., who has a catarrh remedy, and is at work on the same track: a person in N. Y. state received one of the Pittsburgh fellows circulars, in which he offered to send the stuff free of charge: the N. Y. man replied that he was willing to try the stuff, and it came by express with charges; New York man declined to pay, whereupon Pittsburgher sends a threatening letter, but offers to compromise and release N. Y. man from all obligation if he will send him a *list of names* of persons who have the catarrh. Rather than have any difficulty, and to settle the matter, N. Y. man paid express charges. Our N. Y. friend has at last had his eyes opened, and wishes us to warn people against accepting packages of medicines free. If our friend lives longer he will learn that no offer of this kind is made unless the one who proposes it expects to get repaid somehow. It is astonishing—but here is an evidently intelligent person who will accept a medicine about which he knows nothing, from a quack about whom his circular should be a sufficient warning. When it comes to medical matters, common sense appears to step one side.....Here is another case from Pa. At a place called Highville, one "Dr. Osborne" issues "The Cabalistic Journal," which presents the inducements for joining the "Cabalistic Society," which is to straighten out the crooked places in the present state of things, and do wonders generally; it costs only $5 to join this concern, which is wonderfully cheap, considering that instruction in alchemy "by which he or she can increase their wealth at will," is among the advantages gained by joining this select company of idiots. A large part of this circular or "journal," is absolutely too nasty to be described. The post-master at Highville cannot be aware of the character of this sheet, or he would discharge his duty by preventing its passage through the mails, and the decent citizens of the place should at once take measures to prevent further disgrace to their community by putting a stop to one of the most rascally sheets that has fallen under our notice....Not since the days of sweet Eddie Eastman, have we had anything so truly "teching" as the "Rev." Levi W. Remington's account of the Cherokee Discovery. Levi was in the City of Mexico—he saw an American being very much shot at and likewise clubbed on to; this was more than Levi could stand; the blood of the American eagle riz, and in short he "went for" that crowd, and for some not very obvious reason, he, with aid of soldiers, got this much mobbed Yank into prison. Yank died, but not before he told Levi his story about how once a big Injun told him about a wonderful plant, it was up in the mountains—the wonderful plants always are—but as this Yank's time was short, he had it all conveniently down in a book which he then and there made over to Levi. We wish we had space to tell the old Yank's story of the discovery of the wonderful shrub, and how afterwards he joined Gen. Taylor's army in Mexico and cured the men after the army surgeons had given them up, and all the rest of it; it is better than any two dime novels, as Levi tells it, and it is just a little ungrateful in Levi that he don't give the old fellow's name. Oh Levi W., you missed your calling when you went for a missionary; this effort of yours shows your true sphere would be found in writing blood and thunder plays for the Bowery theatres. Levi, are you good at word puzzles? Take the letter v out of Levi, and properly transpose the other letters, and it will make a word that exactly describes your story.

VARIOUS AND DOUBTFUL.

Inquiries continue to come about "real estate agents," who want $5 or $10 in advance, about curb-stone Wall street brokers, who are flooding the country with their circulars, which offer immense returns for small investments; remarkable mining companies, in which the purchase of a $5 share is likely to lead to a fortune, and similar projects. Regarding these, we can only repeat our advice not to put a dollar into the hands of an unaccredited stranger for any purpose whatever. Remember that legitimate schemes, those which offer a fair prospect of profit, do not have to go a begging all over the country by means of circulars; there are a plenty who stand ready to invest in any enterprise, if it can be shown that "there's money in it."

Fertilizers for Corn.—Special fertilizers for corn are most effective when applied near the seed in the hill or drill. One ounce to a hill, will use but about 300 pounds per acre, which is a liberal dressing.

Once More.—For the benefit of our many new subscribers, we must repeat what we have often stated: that editorial letters, to meet with attention, must be signed. Aside from the impropriety of writing to *any one* an anonymous letter, it is to the writer's interest to give his name. A large share of inquiries are of a kind that the answers to them interest no one else in the world save the person who makes them. Rather than take up space that belongs to all our readers, to answer questions for the benefit of one of them, we prefer to reply by mail. Every day almost brings us letters which the writers omit to sign.—"C." of Hanover, N. H., and many others, will understand why their letters are un-noticed. Our new readers should understand that we do not publish names if the writers do not wish it. Sign any name, but give us your own name and address, and draw a line around it, and we shall understand that the writer desires his name withheld. We do not notice anonymous letters.

Saving Green Clover.—"P. O. H.," Clover in a green condition, but free from damp, has been perfectly well preserved or cured, by putting it away in a mow, with layers of straw alternating with the clover. The layers should not be over a foot thick, and some salt should be spread upon the clover. The whole mass fermented strongly, but when used, was found to be excellent feed, the straw smelling like clover hay. The straw must be perfectly dry.

To Remove Warts.—"W. G." When the wart admits of it, a strong waxed thread may be tied tightly around it, close to the skin. In a short time the wart, will become loose and fall off. The spot may be touched daily with a piece of moistened lunar caustic.

Pump for a Stock Farm.—"J. I. K.," Adams Co., Pa. The American Submerged pump is one of the best for a stock yard. The valves being of metal, do not wear perceptibly, it can not freeze up, and is easily worked as a suction or force pump. It is made by the Bridgeport Manufacturing Co., Bridgeport, Ct.

Plan for Barn.—"C. R. S.," Berrien Co., Mich. The stock barn of which a plan was given in the *Agriculturist* of April, 1874, could be built by any carpenter from the plan itself. If he were furnished with the size of the buildings, he could easily make up a bill of the lumber needed. The size will depend upon the number of stock. For a 100-acre farm, well stocked, the yard should be 100 ft. square, and the sheds each 100 ft. long.

Effects of Subsoiling.—"G. P. W.," Union Spring, N. Y. The effects of subsoiling are to dry the surface, by permitting the water to sink through the upper soil. This tends to warm and aerate the subsoil. It also permits the roots to penetrate deeper, and we have never known or heard of a case in which a field was not improved by subsoiling. By subsoiling is meant only the breaking up of the subsoil, and not the bringing it to the surface.

Preserving Fence Posts.—C. Harlan, Wilmington, Delaware, writes that on March 8, 1845, he built a new fence. "The chestnut posts were sawed the year previous, and then soaked in a solution of corrosive sublimate for several weeks. The solution contained one lb. of corrosive sublimate to 14 gallons of water." "A few weeks since," writes Mr. H., "this fence was removed, and the posts were found to be as free from every appearance of decay as when set nearly thirty years ago. Judging from their perfect appearance, there is every reason to believe that they would last a hundred years."—The effect of corrosive sublimate is to coagulate the albumen, and also to prevent the growth of fungi. Many other substances have the same effect, such as crude carbolic acid and petroleum. Heating the wood to the temperature of boiling water, or even less, has the same effect, and this is one reason why charring posts helps to prevent their decay. Corrosive sublimate is a dangerous poison and an expensive article, and we should prefer to use some other preservative.

Jacks and Mules.—"F. W. G.," Ellis Co., Kansas. Mules are chiefly bred in southern Indiana, Illinois, Missouri, Tennessee, and Kentucky. Good jacks can be procured in almost any portion of these districts. They are valued at $300 and upwards. The breeding of mules is as profitable as any other stock business, but it must be carried on with skill to be successful.

Chicken Lice in a Stable.—"J. H. B.," Watertown, Ct. When a horse stable has become infested with chicken lice, the vermin may attack the horse and give him a great deal of trouble. He will be very restless, bite himself, roll and kick, and if not freed from them may be seriously hurt. It would be well to wash him all over with luke-warm carbolic soap suds, and rub him dry with a woolen cloth. The stable should be washed with lime-wash, to every pail of which an ounce of carbolic acid is added. This trouble is easily prevented by not keeping poultry in or near the stable.

Basket Items continued on page 197.

A Pennsylvania Dairy.

Eastburn Reeder, of Bucks County, Pa., sends us a sketch and description of a combined ice and dairy-house, which he has had in successful operation since July last. Nothing in dairying is more important than to secure a proper temperature and perfect purity of atmosphere, in the apartments where the milk and cream are kept, and the butter is made, and it will be seen by the following description, that these points have been well considered in the arrangement of this dairy. The building is shown in figure 1. It is 34 feet long, and 15 feet wide, and stands at a distance from any other building or any contaminating influence. It is divided into five apartments, the ice-house, seen at *a*, figure 2, the milk room, *b*, the vestibule, *c*, with stairs leading to the winter milk-room below, and an attic above, for the storage of sawdust for the ice. The ice-house is 12 ft. square, and 14 ft. deep, holding 36 loads of ice, or over 2,000 cubic feet. It is 6 ft. below ground, and 8 ft. above. The walls are of stone, 18 inches thick. The frame building above the wall is 8 ft. high. The lining boards of the ice-house extend down the face of the wall to the bottom, making an air-space of 18 inches, which is filled with sawdust. The

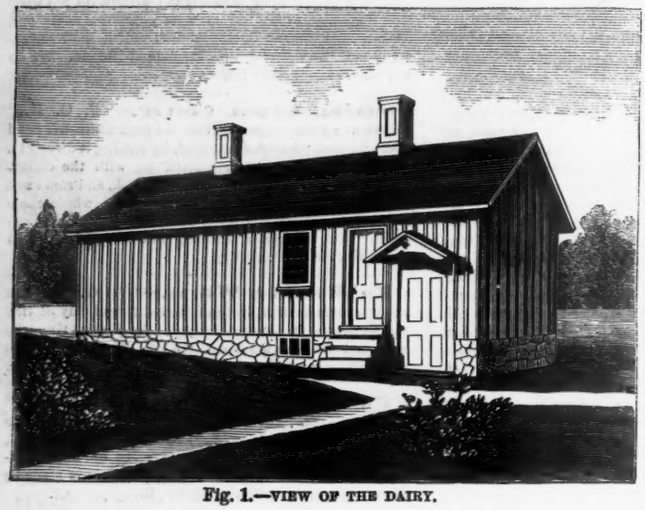


Fig. 1.—VIEW OF THE DAIRY.

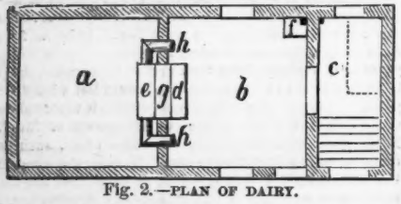


Fig. 2.—PLAN OF DAIRY.

ice-house is filled through three doors, one above the other, at the rear end. There is perfect drainage at the bottom of the ice-house, ample ventilation above, and no currents of air can reach the ice.

The milk room (*b*) is 12 feet square, and is 1 foot lower than the ice-room. It is divided into two stories of 7½ feet each, for winter and summer use. A ventilator enters the ceiling of the lower room, and leads to the cupola at the top, furnishing complete ventilation for both rooms. The vestibule (*c*) is 4 feet wide, and 8 feet long. Here the milk is strained and skimmed, the butter is worked, and pans are stored. The floor is of flagging laid in cement, as is that of the winter or lower dairy. The pool (*d*) which contains ice-water, is 36 inches long, 16 inches wide, and 20 inches deep, and in this the deep pans and cream kettles are immersed. The waste from the ice-box (*e*) can be turned into this pool. If the deep can system of setting milk should be practiced, this pool can be lengthened to 12 feet. A drain (*f*) carries off all the waste water from the room. At *g*, figs. 2 and 3, is a cooling cupboard, located in the wall between the ice-house and the milk room, 6 feet high, 4 feet wide, and 18 inches deep. This is lined with galvanized sheet iron, has a stone slab at the bottom, and two slate shelves 15 inches wide, on which the cakes of butter are hardened before they are packed for market. A current of cold air can circulate around the shelves, as they are 3 inches narrower than the depth of the cupboard. There are latticed blinds in the doors of the cupboard, shown at *i*, *i*, figs. 3 and 4, where the doors are shown as open and closed. A current of cold air can pass through the lower lattices, and this causes an equal current of warmer air to pass through the upper ones. This warmer air, cooled by contact with the ice-box, *e*, passes down and out into the milk room, where a temperature of 60 degrees is easily maintained. By closing or opening these lattices, the change of temperature is regulated as may be desirable. At *h*, *h*, fig. 2, are ventilating pipes, which are provided with registers, seen at *r*, *r*, figs. 3 and 4. These communicate with the air chamber beneath the ice-box, and also with air flues at each end of it; thus two additional currents of cold air can be created when they may be needed. The windows of the lower milk-room are close to the ceiling, and above the surface of the ground outside. They are 3 feet 18 inches high. They are made with outer wire cloth screens, glazed sashes, and inner shutters or blinds. The milk-room can thus be aired and darkened at the same time, if this is desired. In operating this dairy, it has been found necessary to use 10 to 15 bushels of ice weekly, in the hottest weather of the summer; the ice-box then requiring filling two or three times each week. The air within the milk-room has always been dry, so that the floor will not remain damp after it is washed, longer than a few hours. The dairy has been examined when in operation, by a committee of the Solesbury Farmer's Club, who reported that it was the best dairy house they had ever seen. By an annoying mistake, the elevation of this dairy was some months ago used in place of one of a horse stable, because it happened to be of the same size.

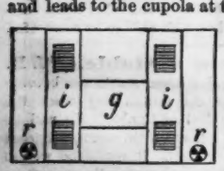


Fig. 3.—OPEN DOORS.

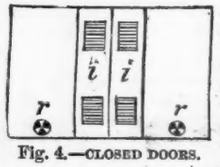


Fig. 4.—CLOSED DOORS.

THE DOG NUISANCE.—While much of the destruction of sheep by dogs is the result of carelessness on the part of the owners of both sheep and dogs, at the same time there are cases in which no possible amount of care can prevent damage. The protection of sheep against these ravages is therefore a matter to be provided for by law. The number of dogs may be usefully lessened, and when damages occur, the owners of the dogs which do the mischief, should properly be held liable for it. "Dog-laws," as they are called, are now becoming general. A very stringent law has recently been enacted in West Virginia for the protection of sheep, with a view to encourage wool and mutton growing in that state, which presents so many favorable conditions for this industry, and a bill has been presented to the New York State Legislature for the same purpose, which deserves to have the hearty support of every farmer in the State.

A Convenient House Costing $800.

BY S. B REED, ARCHITECT, CORONA, LONG ISLAND, N. Y.

The accompanying plans were designed for a simple, compact, and economical house, and will be appreciated by any one who may desire to know just how little is required to build a comfortable home. They provide ample room for a small family....The **Cellar** extends under the whole house, the walls are built as shown in the details of foundation and frame, given in the April *Amer. Agriculturist*, with 3 feet of masonry, and 3 feet of frame work....The **First Story** contains a good sized Hall, Parlor, and Kitchen or Living Room, with two closets, pump, and sink. The stairs to the cellar lead directly from the kitchen, passing down under the stairs in the main hall. A "fire-place heater" can be put in the parlor fire-place, which will also warm the chamber above. This method of heating is economical, and occupies but little room. ....The **Second Story** has three good sized rooms, two closets, and small hall, in the main house, and an attic over the kitchen. The floor of the attic is one foot lower than that of the main house; this gives valuable room for storage, etc. ....The highth of the first story of the main house is 8 feet 6 inches; of the second story, 7 feet. The highth of the kitchen ceiling is 7½ feet. The attic is arranged to have just standing room in the center....A great saving of time and trouble is made, when openings are provided for *regular sizes* of sash, blinds, and doors, as they may be obtained of seasoned and well made stock, at any time, from any dealer in such materials. These plans are drawn with reference to such regular sizes, viz.: the first story windows are 2 ft. 7 in. by 5 ft. 6 in.; second story 2 ft. 7 in. by 4 ft. 6 in.; cellar, 2 ft. by 2 ft. 8 in., all 1¼ inch thick. All principal windows should have their frames made with pockets and pulleys—and the sash hung with iron weights and good cord. The cost for the addition of these necessary parts, beyond what is required for the plain frame, is about as follows, for each window of ordinary size: 4 pulleys, (at 40c. per doz.) 14 cts.; 20 lbs. iron weights, 2½c. per lb., 50c.: ¼ lb. sash cord, 16c. per

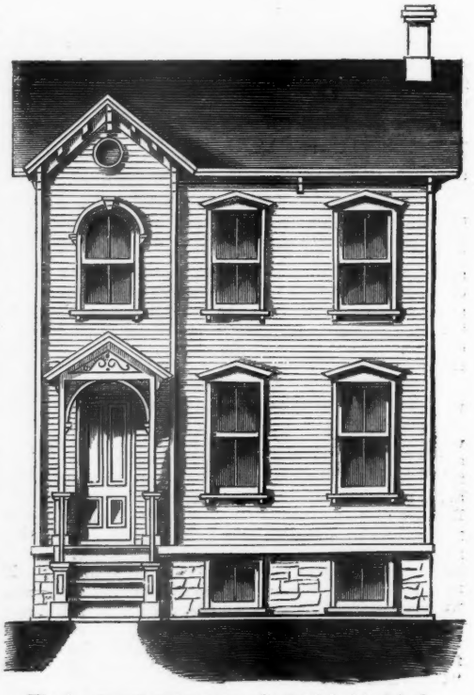


Fig. 1.—FRONT ELEVATION.—Scale, 8 feet to 1 inch.

lb., 8c; 1 doz. screws, ¾ in., 35c. per gross, 3c.; labor putting in pockets, pulleys, etc., 20c.—Total 95 cents., and when once done, will need no further attention or expense, while the house lasts. The satisfaction of having neat fitting, easy working sash, where the upper, or lower one, may be opened at will, is great. The saving of little fingers, and older nerves, to say nothing of shattered sash and glass, more than repays the extra cost of hanging sash....The front, rear, and parlor DOORS are 2 ft. 8 in. x 6 ft. 8 in. x 1¾ in.; other first story doors, 2 ft. 6 in. x 6 ft. 8 in. x 1¾ in.; second story doors, 2 ft. 6 in. x 6 ft. 6 in. x 1¾ in.; all 4-paneled, and neatly molded. The 1¾ inch doors have mortice locks; other doors rim locks, all with porcelain knobs and escutcheons....BLINDS are included for the first and second stories, in the estimate appended, at an average cost of $2.40 per pair, and may be omitted—but are recommended as useful, for they protect the sash from storms, and can be operated to give almost any desired light or shade in the rooms.... Many people may be in circumstances that would justify the building of one part of a house first, to be occupied as a temporary residence until means and opportunity warrant the building of the whole. A newly married couple could arrange to have the kitchen part built as a residence for a season, rather than forego the opportunity of setting out trees, vines, and shrubbery, planting, and otherwise developing their grounds. They would then be near the work when building the main part, to superintend it, and care for materials, saving much that is often wasted, or lost. The wing, or kitchen part, could be built at a cost of about $185, so arranged as that the main house could be joined to it at any time—or, what would be better, the main house may be built first, at a cost of about $650, and the kitchen added at convenience.....The exterior dressing of cornice, window-caps, and stoop, are decided in their character for simplicity, and boldness, giving a generous and finished appearance to the whole....**Novelty Siding,** fig. 6, is mentioned in the estimates for these houses, (see March No., p. 89.) This form of siding I first introduced some twelve years ago, since which time it has grown into general favor and use in this neighborhood. It has the following merits to recommend it: 1st, It is easily put on by ordinary mechanics. 2d, When properly nailed to the frame, it strengthens it, so as to make bracing of the frame almost unnecessary. 3d, The spaces between the studding, when the interior is plastered, are each air-tight compartments, containing only stationary air, which is a non-conductor of cold (or heat), thus protecting the inside wall from the extreme change of outward temperature. 4th, A cheaper quality of lumber can be used, the more cross-grained the materi-

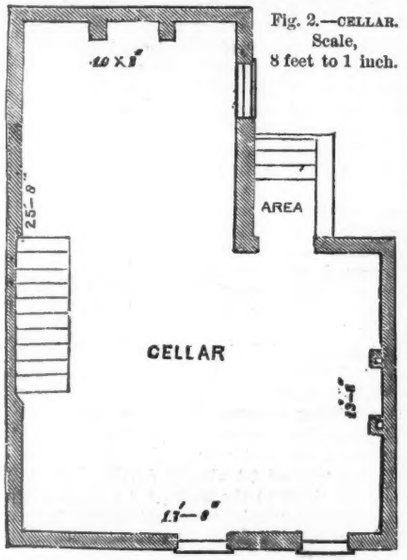


Fig. 2.—CELLAR. Scale, 8 feet to 1 inch.

als, the less likely they are to check, or shrink, and any small, sound knots are easily covered with shellac before painting, which closes them effectually. 5th, The general surface is even, so that any brackets or other ornamentation can be put on

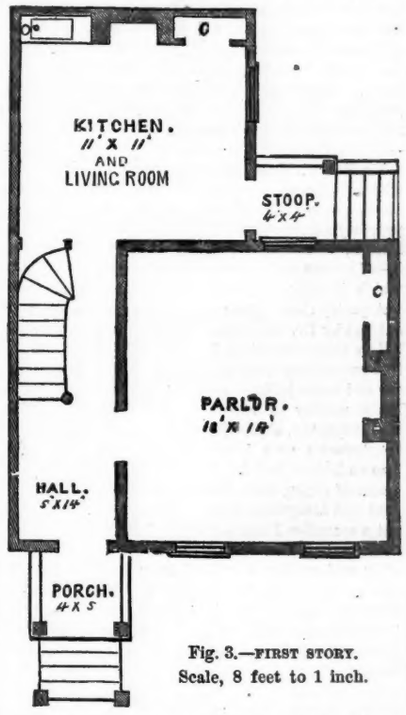


Fig. 3.—FIRST STORY. Scale, 8 feet to 1 inch.

without the trouble and difficulty of "scribing" them up to the clap-boarding....The **Shingling** referred to in the estimate, is of 18-inch Pine Shin-

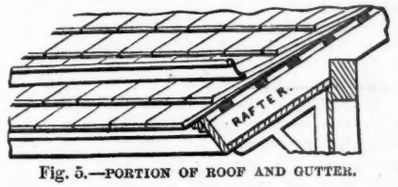


Fig. 5.—PORTION OF ROOF AND GUTTER.

gles, and may be laid 5½ in. to the weather, and secured with large headed "shingle nails." It is best in laying shingles to lap at one-third the breadth, never in the center, for should one shingle check in the center, as they are liable to do, an opening is made through the three courses, and a leaky roof will be the result. "Shingling lath" 1½ in. x 2 in., with the lower edge placed just where the butts of the shingles would cover, will allow air to freely circulate on both sides of the shingles, and preserve them one-third longer than when laid on close planking, which holds the moisture, and assists decay of every part of the roof....**Gutters.**—The old wooden gutter has nearly gone into disuse, and always seemed a barrier to any satisfactory finish of cornice. It was difficult to get timber of sufficient width for projections, and in such cases the cornices were proportioned by boxing off, and building up around this "gutter stick," which was bad construction—the outer edge of the gutter, being higher than the edge next the house, would cause the water, during heavy storms, or when the leader was choked up, to flow over against the frame work of the building, which was one of the most frequent causes of decay and settling in the older houses in this country.—The tin-lined "box" and "trough" gutters are often troublesome; the tin cannot be laid in them except in long lengths, which have been soldered together while flat and smooth. To lay these long lengths into the ready-formed gutter, requires much bending and hammering, which breaks the best tin at the soldered joints, on the under-side, where it is impossible to repair it, so that, while it may not appear at once to leak, it is sure to do so soon, to be discovered after the cornice has been swelled out of shape or destroyed. The gutter that I have adopted in all cases where practicable, (see section, fig. 5,) either for shingles or slate, is made of charcoal tin, 14 inches wide, in lengths as long as can be well handled. One edge is turned or rolled up around a ¼ iron rod, which makes a strong edge. Then a bend is made at 3½ inches from the turned edge, forming a right angle the whole length. This is laid on the second course of shingles, with one end lower than the other, so as to give a good run for the water. The ends are turned up where required, to stop the water, and a tube put through the cornice in the usual manner....For **Tin Roofs,** having a pitch of at least one inch to the foot, the gutters are formed in a similar manner, with the flat or bottom part about ¼ inch wide, making a flange which is soldered to the roof near the eaves, to a line drawn at an angle to make one end lower than the other, as for shingle roofs. This is the simplest and best kind of gutter, will outlast any other, and in the event of a possible damage, or leakage, no harm will be done beyond the loss, or waste of the water that runs off over the eaves. It can be easily repaired, or replaced at any time, without interfering with the principal roof, and it saves the trouble, and expense, of building and boxing for gutters, or of making cornices with special reference to them, and it is cheaply constructed.

Fig. 6.—"NOVELTY SIDING."

Estimate of Cost of building by this plan in the vicinity of New York City:

38 yards Excavation, @ 20c. per yard			$ 7.60
5,000 Brick, furnished and laid, @ $15 ₱ 1000			75.00
230 yards Lath and Plastering, 3 coats, @ 35c. per yard			70.38
1412 feet Timber, @ 2¼c. per foot			31.77
viz. 1 Sill, 3x8 in. x92 ft. long.		1 Girt, 4x8 in. x12 ft. long.	
4 Posts, 4x6 in. x21 ft. long.		2 Ties, 4x6 in. x16 ft. long.	
2 Plates, 4x6 in. x 19 ft. long.		2 Ties, 4x6 in. x19 ft. long.	
2 Plates, 4x6 in. x 12 ft. long.		18 Beams, 3x8 in. x16 ft. l'g.	
10 Beams, 3x7 in. x12 ft. long.			
1 Locust Post, 4 inch			25
220 Wall Strips, 2x4 inches x13 feet long, @ 16c			35.20
160 Novelty Siding Boards, 9¼ inches, @ 38c			60.80
30 Rebated Siding, 9¼ inches, @ 38c			11.40
92 feet Cornice Materials			15.00
100 Shingling Lath, @ 6c			6.00
16 bunches shingles, @ $2.25			36.00
Tin Gutters and Leaders			10.00
90 tongued and grooved Flooring, 9½ inches, @ 35c			31.50
8 Windows with Blinds, @ $8			64.00
3 Cellar Windows, plain, @ $3			9.00
2 Stoop Materials			20.00
Stairs, 1st story and cellar			50.00
12 Doors and materials			48.00
Carpenter's Labor (not included above)			100.00
Painting, two coats			50.00
Cartage, average one mile			15.00
Extras, for Base, Sink, Pump, and Nails, etc			52.88
Total cost of materials and construction			$800.00

THE TROPHY IN FRANCE.—Though the writer sent seeds of the Trophy tomato to France the first year it was offered here, we have seen no notice of it until recently. M. Bossin, the high authority upon garden vegetables, says in the *Revue Horticole*,

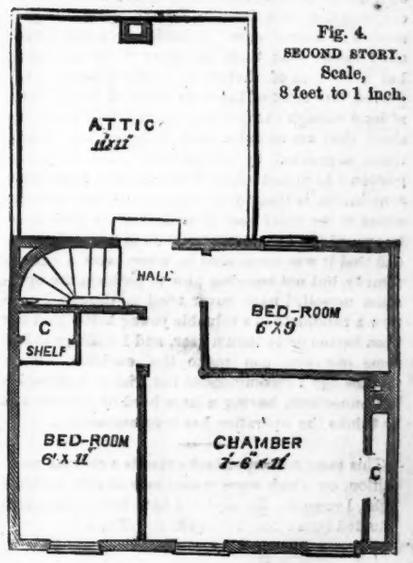


Fig. 4. SECOND STORY. Scale, 8 feet to 1 inch.

"This Tomato appears so good that we believe it to be our duty to give it particular mention as an 'alimentary and condimentary' plant." Europeans

are gradually learning that there are some things in this country worth having, and that all the good things do not originate on the other side of the water.

Ogden Farm Papers.—No. 63.

BY GEORGE E. WARING, JR.,

I have been asked about cattle and sheep-raising for Florida, Georgia, and South Carolina, how to get the best result from raising grades by crossing thoroughbred bulls on the native cows of the region; and in what way to get the best improvement upon common sheep. If the making of good butter for sale is an important item of the business, the Jersey is the best breed to be selected. If, however, a combination of milking and beef-making qualities is desired, I should then suggest the use of a thoroughbred Devon bull, say from stock long ago introduced into Georgia by Mr. Peters, of Atlanta, changing the bull every two years to secure an infusion of fresh blood. Devons, for this purpose, would perhaps be no better than Ayrshires, but it is not so well demonstrated that the latter are well adapted to the southern climate, and good Devon grades are admirably well suited for the purposes required, being hardy, thrifty, tractable, and of good size. As a rule, they are a good milking race, and easily fattened to good beef. Concerning sheep, I should decidedly recommend crossing with the Cotswold ram. The proper plan would be to get the best lot of native ewes to be readily found, and to put Cotswold rams with them, this whether the ewes are grades of either Merino or some long-wooled kind. In this way, early maturity and an increased quantity of wool will be secured. The wool will be nearly doubled on the first cross. To establish an improved flock, keep the whole or a part of the ewe lambs thus bred, and continue to breed Cotswold rams to them, never using a grade ram. However, the largest returns of immediate profit will be secured by feeding the ewes from the time the lambs are dropped, systematically and well, until they are ready for the butcher, supplying their places as breeders by a new lot of natives. Perhaps the two plans might be combined; or, keep all the ewe lambs, get *two shearings* and one lamb, and have them ready for the butcher as soon after weaning their lambs as possible, to make room for the next crop of ewes, and so on.

I probably get more letters on the subject of the failure of cows to get with calf than on any other, and have had some trouble of the same sort in my own herd. Among these letters, and as a result of conversation with farmers, I have come into possession of more "sure" rules for securing the desired result than there are cows at Ogden Farm; but every one of them that I have tried has appeared, like most of the sure rules of life, to have at least enough exceptions to prove their truth. In short, they are no rules at all, only opinions, sometimes supported by coincidences. The only suggestion I have met which seems to have a scientific foundation, is that for the removal of the clitoris, which is the chief seat of irritation. I have long known of the use of this method in Great Britain, and that it was considered in some cases a certain remedy, but not knowing how to perform the operation myself, I have never tried it, though I have now a candidate in a valuable young heifer that has been barren more than a year, and I shall try to find some one who can make the excision. Some months ago I recommended the trial to a physician in Connecticut, having a large herd of Jerseys, and he thinks the operation has been successful.

This same correspondent submits a curious proposition, on which some reader may be able to throw light, I cannot. He says, "I have four dash churns situated thus: No. 1 (4 ft.) No. 3

6 in. 6 in.

No. 2 (4 ft.) No. 4

Four feet between 1 and 3, also between 2 and 4; about six to eight inches between 1 and 2, and 3 and 4. How the butter *always* comes in No. 1 in less than two-thirds of the time it does in Nos. 2, 3, and 4, and in Nos. 2, 3, and 4 it always comes in about the same time, not more than five or eight minutes. If it takes 60 minutes for No. 1, it will take an hour and a half or three-quarters for either of the other three. If any one can explain this to me, I think you can. If not, I conclude what 'you and I do not know is not worth knowing.'"

Mr. Robert Hood, of Cumberland Co., Pa., asks why milk drawn three or four weeks before calving curdles on boiling as sour milk does, and he very properly suggests that if the time of calving is not known, occasional boiling of the milk will indicate it—of course only when cows fail to dry off in time, which is very frequently the case with Jerseys.

A pretty clear light seems to be thrown on this subject by Dr. Sturtevant, in his recent paper read before the Connecticut Agricultural Society, which, like everything coming from this careful investigator and unprejudiced reporter, seems to me peculiarly worthy of attention and confidence. The facts reported, although at least confirmed by Dr. Sturtevant's own investigations, may have been known before, but he is certainly entitled to the credit of giving them to the public in a very intelligent and acceptable form. He says that butter is not a secretion from the blood, but that it is a part of the actual material of the cow's udder, which, after undergoing a sort of fatty degeneration, is thrown off during the production of milk, and is instantly mingled with it in the ducts and reservoirs leading to the teat,—that is to say, the whole interior surface of the udder, constituting the walls of the interstices through which the milk passes, is a fatty formation, that is, it is made up of minute cells containing fat as it exists in the globules of cream. These cells follow the common law of reproduction by the process known as "budding," or the formation of two cells out of one, and the growth of both to the full size. As these cells grow they are separated from the organism and pass into the milk, and this is the source of all the butter globules in all milk. During the excitement of the reproductive organs that precedes and follows the birth of the calf, the multiplication of the cells becomes more active, and they are cast off prematurely, and often before they are fully separated, cast off in groups; there is an undue proportion of cell membrane, the fatty degeneration has not been completed, and they give to the secretion the character that we know as *colostrum*, which is the purgative milk of a cow that has just calved, or is about to calve, which is not fit for use, but which is especially needed for the cleansing of the intestines of the new born progeny. The same production of colostrum corpuscles giving their peculiar character to the milk, may take place during fevers or as a result of external injury to the udder. It is this formation of colostrum that spoils the milk as referred to in Mr. Hood's letter.

Dr. Sturtevant has made a careful microscopic study of milk, especially with reference to the size and character of the butter globules; and although he is an Ayrshire breeder, and a champion of that race, (and finds ample physiological reason for the faith that is in him), he does not hesitate to accord to the Jerseys all the advantage that the study of the globules shows them to be entitled to. He says that these globules are largest with the Jerseys and smallest with the Dutch, or so-called "Holstein" cows, the Ayrshires occupying an intermediate position. The globules consist of butter enclosed in a very thin sac, and the process of churning causes the rupturing of the sacs, allowing their contents to adhere, and to "come" as butter. Other things being equal, the larger the globule the quicker the churning, and, consequently, the more uniform the size of the globule, the more complete is the extraction of the butter. The influence extends also to the length of time needed to prepare milk for churning; he says: "Twenty-four hours' standing will hasten the churning of Jersey milk more than will forty-eight hours affect the churning of Ayrshire milk." Butter from large globules is of better grain than that from small globules of even the same milk, which may account for the disadvantage of what is called overchurning; as the larger and better grained globules, which make the best butter, will be the first to come, and the quality must be injuriously affected by adding to this first butter the product of the later rupturing of the smaller and less perfectly grained globules. During the early milking of a fresh cow, when the functions of the udder are carried on with the greatest activity, the globules are gorged and the relative differences in size are exaggerated. The butter begins to come after churning a short time, and as the process goes on, globules of smaller size are ruptured and added to the mass, giving an irregularity to the character of the product. But as time elapses, the production of the milk becomes more regular, the difference between the sizes of the globules is lessened, and, while a longer time is required for churning, the product is more uniform, and more butter is extracted in proportion to the actual amount of butter-globules in the milk. Again, as the larger globules are lighter than the smaller ones, not only will milk having large globules throw up its cream more rapidly, but the cream first rising will contain the largest globules, and therefore make the best butter.

These internal milk-glands of the udder are allied to the glands of the skin, and it is by analogy that we find a fine and free-skinned cow to be a good butter producer, and that a staring coat and tight hide, (whether resulting from breed or from temporary low condition), to be an index to permanent or temporary defective butter production. Such a course of feeding as will improve the condition of hide and hair will also improve the development of the butter; good feeding either increasing the size of the globules developed, or so stimulating the activity of the parts that cell budding and separation becomes more rapid. The character of the globules, and their manner of budding or separation is a matter of structure, and structure is a matter of race or breed, so that the amount and character of the butter produced is due less to the manner in which an animal is fed, than to the breed to which it belongs; although, as the globule-producing character of the race is the *ultimate* result of the slow influence of care, climate, and diet, acting on many generations, we may, by judicious treatment, steadily improve the character of the animals we breed, from generation to generation; but the wise course would be to begin with the best developed race we can find, in order that our improvement may start from the highest possible point. In like manner, by starvation, exposure, and abuse, we may cause a deterioration of even the best race, and we may soon reduce a race of average good quality to a really worthless condition. The practical teaching of Dr. Sturtevant's investigations, therefore, is, that the best animals for the butter-maker are those in which the large butter-producing cell is a fixed characteristic, and that whatever the natural or structural condition of the animal or race may be, it will improve or deteriorate, according to good treatment or to bad treatment.

Different races have different structural tendencies; a race bred for beef, has its development of cells subject to fatty degeneration, placed in the adipose tissue; in a butter producing breed, they are placed in the udder; at the same time, the tendency to fatty development in either class of organs, is closely allied, and may be, in the same animal, to a greater or less extent transformed from one to the other; so that the great point is, to have an animal with the fat-producing tendency as a chief characteristic, in order that when the production of butter ceases, as the milk dries off, there will be a deposition of fat in the carcase, and as the milking becomes active, there will be a tendency to divert the fat-producing parts of the food to the udder, and even, as is constantly seen, a transferrence of fat already developed from the adipose tissue to the udder, for a demand upon the blood to supply cream in the udder, in excess of what the food is able to furnish, will cause the blood to carry in this direction, the fat thrown off by the reduction of the adipose tissue.

Another of Dr. Sturtevant's propositions is this: "The superior cow is more a creature of art, and

the inferior cow more the production of nature, and, accordingly, the best and poorest cow of the herd, being fed with an increased supply of food, in every case the better cow will respond to a greater extent than the poorer,"—that is to say, the better cow is one whose structure, developed through long generations of improving influences, determines the deposition of assimilated food to a greater degree in the udder products. There is a limit to the possible butter production of every cow, and if butter be the product sought, there will be no gain in feeding beyond this limit. If one cow is capable of making two pounds of butter per day, and another but one pound per day, the one will turn into profit only half as much food as the other—that is, only half as much of what is in excess of the actual requirements of vitality. If it takes ten pounds of food to keep the animal in good condition, an additional ten pounds may all be returned in the product of the good cow, while only half of it would be returned in the product of the poor cow, the other half going to waste. Or, as Dr. Sturtevant states it, "the quantity of milk (or butter?) yielded by an animal, is dependent both on her structure and nutrition. In the presence of sufficient food, it is determined entirely by structure, which is equivalent to saying, by inheritance." The improvement of the domestic cow has increased her capacity for digesting food, and her economy in digesting, and has extended to her glandular structure, giving it a greater power to throw off the products of digestion in a valuable form. It is believed that the effects of domestication and copious feeding, has been actually to increase the length of the intestines, and Cuvier states that while the intestine of the wild boar is 9 times the length of his body, that of the common domestic boar is 13½ times, and of the Siam breed 16 times. Whether entirely from this cause or not, it is certainly true that the superior cow will give a larger proportional return from copious feeding, than will an inferior one; and while it may be profitable to feed corn-meal and other nutritious food to animals of the best class, it is quite sure to result in a loss if fed to those of the worst class. The result we wish to obtain in feeding dairy animals, is to obtain a valuable product in the form of butter and cheese, and this is an artificial result—to obtain it we must use artificial means, that is, an animal developed *by art* to an unnatural determination of the products of digestion to the udder.

Some of Dr. Sturtevant's general conclusions are as follows: "The production of butter is largely dependent on breed; There is a structural limit to the butter production of each cow; When the cow is fed to this limit, increased food can not increase the product; The superior cow has this structural limit at a greater distance from ordinary feed, and is more ready to respond to stimuli than the inferior cow; The character of the food has some influence on the character of the butter, but even here breed influences more than food.

Science Applied to Farming.—V.

By Prof. W. O. Atwater, Wesleyan University
Middletown, Conn.

How Science is Saving Money and Increasing the Profits of Farming—Further About Feeding Animals.

Many farmers consider straw and cornstalks as nearly worthless for fodder. Others feed them to their stock, and find them very valuable. On English farms you may see straw stacked as carefully as hay, and sold at a guinea ($5.09 gold) per ton, for mixing with other food for stock. And in France and Germany straw is as staple an article of fodder as hay. I recall one case in Germany, when oat straw was rated at $5.50, good clover hay at $8.50, and field beets at $2.15, gold, per ton; another where barley straw was valued at $4.33, and clover hay at $13.00 per ton, these being the prices at which those materials were actually bought and sold for fodder. And in those parts of this country and of Europe especially, which are most noted for their successful agriculture, straw and like fodder-materials are used with profit, not only for store cattle and sheep, but also for horses, working oxen, milch cows, and fattening cattle. The theory that these foods contain so much material for making meat and milk and producing animal heat and muscular force, is well explained on scientific grounds, *is proved by practice* and *is supported by accurate experiments.* Here is a table giving the average values of different foods as based upon the amount of *digestible, nutritive material* they contain, taken from the German farmer's diary, referred to in previous articles:

	Per ton.		*Per ton.*
Meadow hay	$9.00	Bean straw	$6.93
Winter wheat straw	4.32	Wheat chaff	6.39
Summer barley straw	4.86	Oat straw	5.49
Corn stalks	5.40	Winter barley straw	4.23
Clover hay	11.17	Pea straw	6.03
Rye straw	3.78		

Now why is it that so many American farmers put so low an estimate upon straw, and like substances, and what is the secret of making them so valuable for fodder in Europe? One reason for this difference is doubtless the fact that here the grain is often allowed to stand too long before harvesting. Early cut straw, like early cut hay, is much more digestible and nutritious than that which is allowed to stand longer. European farmers, who make so good use of straw, harvest their grain much earlier than many do with us. The land there, too, is much better manured than it is here, and grain, well supplied with barnyard manure, guano, or other fertilizers containing much nitrogen, yields a large luxuriant stalk, which keeps green until quite mature. Well manured hay and clover are more nutritious than those poorly manured, and the same is doubtless true of straw.

But the great reason why farmers find such foods as straw of little worth, is that *when fed alone*, they have really but little value. To get the full benefit of all the digestible material of straw, other things must be mixed with it. It will be well worth while to study this matter carefully. It was explained in the last article, that the value of food for making meat and milk, or producing heat to keep the animal warm, or muscular force needed for work, depends upon the *digested* portion. In an experiment there described* an ox digested 7 9/10 lbs. from 16 9/10 lbs. of good hay. At this rate the animal would digest from 17 lbs. of hay, and from 20 lbs. of straw, about the same amount of nutritive material, viz.: 8 lbs. Mark that, *there was as much nutritive material from 20 lbs. of oat straw as from 17 lbs. of hay.* This is not mere theory, it is the testimony of the animals themselves, verified by the strictest scientific tests, not in one case alone, but in scores, yes hundreds of accurate feeding trials. But it would be absurd to claim that 20 lbs. of straw is worth as much for fodder as 17 lbs. of hay. The *quantity* of the nutritive material and its *value* are two different things, as the table below explains:

	Digestible materials.	*Consisting of* *Albuminoids.*	*Carbo-hydrates.*
20 lbs. of straw	8 lbs.	.65	7.35
17 lbs. of meadow hay	8 lbs.	1.37	6.63

In other words, the meadow hay furnishes twice as much digestible *albuminoids* as the straw, and is more valuable fodder. Straw is, however, very valuable when fed so as to secure the utilization of the digestible material which it actually contains. To make it an appropriate fodder for the ordinary demands of our domestic animals, we must mix with it some other substance rich in nitrogen. In fact, in the experiments referred to, the straw was mixed with bean meal, which contains a large proportion of albuminoids. In this way the fullest utilization of both was secured.

Let us examine this matter closely. We learned in the last two articles, that to feed stock economically, the food must contain just such quantities of albuminoids and carbo-hydrates, as are adapted to the demands of the animals. An ox at rest in the stall, or a dry cow, requires a certain amount of food containing a certain quantity of these substances. But if the ox is to be kept at work, or the cow is to give milk, more food will be required. And this extra amount must consist largely of albuminoids. The reason for this is very simple. Milk is produced from material in the food. All the casein (curd), and much of the fat (butter), are made from the albuminoids. So food for milch cows must be rich in nitrogen. The same is true of fattening cattle, since all the lean meat, and much of the fat meat, comes from the nitrogenous material, (albuminoids), of the food. In the same way the muscular force is produced in great part from albuminoids, and the working ox must have food rich in nitrogen.

The practical lesson to be learned, is, that we need not necessarily feed these animals a large extra quantity of more costly hay or clover, to get the additional albuminoids, but that we may use straw and the like, to supply carbo-hydrates, and add a small quantity of food containing much nitrogen in a concentrated form. For example, a good quantity of straw, with a few pounds of beans, oil-cake, etc., furnish the animal with just the same necessary food materials, as a large supply of more costly hay. It is by carefully studying these principles and applying them to practice that the greatest saving, and consequently the largest profit, is made.

We have not space to explain the elaborate and costly feeding trials by which these principles have been learned, but we may illustrate the facts by some familiar examples. Young succulent grass or clover is a natural food for milch cows. With these they will give a full yield of rich milk. They will likewise do well on hay of prime quality such as that which grows on uplands and consists of grasses mixed with clover and other leafy undergrowth. But it is a matter of common experience, that the best production of milk can not be obtained from hay of average quality, and still less from that of inferior grades, such as is grown on marshes, or has been injured by rain. With straw alone, the yield of milk would be very poor indeed. Store cattle, however, as oxen at rest, and dry cows, may be kept in fair condition on even the poorer qualities of hay, and they will live and sometimes do passably well on good straw. Now let us see how much of digestible material these foods would contain. From table 6, in the April number of this series, we make the following calculations, the figures representing general averages:

There is contained in	*Digestible Substances*	*Consisting of* *Albuminoids*	*Carbo-hy'drates*	*Fat.*
	lbs.	lbs.	lbs.	lbs.
110 lbs. young grass	15.5	2.5	12.6	0.4
30 lbs. of prime quality hay	15.6	2.5	12.8	0.3
33 lbs. of average quality hay	15.8	1.8	13.7	0.3
40 lbs. of inferior quality hay	15.6	1.4	14.0	0.2
40 lbs. Oat straw	15.6	0.5	14.9	0.2
47 lbs. Wheat straw	15.7	0.4	15.1	0.3

Now let us compare the above figures. A cow will digest from 110 lbs. of young grass about 15½ lbs. This would consist of 2½ lbs. albuminoids, 12⅗ lbs. carbo-hydrates, and ⅗ lb. fatty matter, and would make a good daily ration for an ordinary cow of 1,000 lbs. live weight. 30 lbs. of prime quality hay would give about the same proportions of nutritive substance, and with this, too, the cow would give a good yield of milk. If, however, she has hay of only medium quality, she would have to eat 33 lbs. to get her 15½ lbs. of digestible substance, and then she would have only 1⅘ lb. albuminoids, or about ¾ as much as before, and the milk yield would be smaller. If she had the inferior hay, she would have to get all the digestible material from 40 lbs. to make up the same amount of 15½ lbs., and would still have but 1⅗ lb. albuminoids. With the straw the case would be still worse. The cow would be unable to digest 15½ lbs. from a daily ration of 47 lbs. It is a remarkable fact that animals do not digest all the really digestible material of their food, unless it has a certain proportion of nitrogen, and this must be larger than that in the straw. One chief defect of these poor foods, then, is lack of nitrogen. What is the remedy? Clearly, to supply nitrogen.

To secure the full value of straw and like materials in feeding, we must combine them with other substances rich in nitrogen. There are a great many substances which contain a larger proportion of albuminoids than is necessary under any circumstances. One of the most important of these is clover. There are certain other plants similar to clover, as lucern, esparsette, and seradella, which are largely cultivated in many places,

* See Table in Article No. IV. April *Agriculturist.*

and should be more generally introduced with us. Beans, peas, and vetches, contain a great deal of nitrogen, and are very digestible. They are among the most common kinds of fodder in many countries. The same is true of oil-cake and cotton-seed meal, and of malt sprouts, brewers' grains, and refuse slump from the manufacture of starch and spirituous liquors. Bran, shorts, and corn-meal, contain considerable albuminoids, though proportionally less than the other materials, as will be seen by reference to Table 6, in the previous article.

I should be glad to say a good deal more about the value of these nitrogenous foods and the proper way to use them, but the editors think that these scientific articles are such heavy reading, that they ought to be short. So I will simply add some German fodder tables, showing in what proportions these foods may be mixed with others, so as to secure the greatest benefit from both.

MORE FODDER TABLES.

In the March article were given a number of fodder tables for oxen and milch-cows. The explanations there given apply to these. The rations are calculated for 1,000 lbs. live weight of the animals.

Table 4 *(of March number, page 92) continued.*

V.—For Fattening Cattle.

T	or U	or V
5 lbs. Meadow hay	6 lbs. Meadow hay	8 lbs. Timothy hay
6 lbs. Oat straw	7 lbs. Oat straw	2 lbs. Barley straw
125 lbs. Potato slump	35 lbs. Beets	42 lbs. Sugar beet cakes
	5 lbs. Rape cakes	
2½ lbs. Rape cakes	1 lb. Linseed [ley	5 lbs. Rape cakes
7 lbs. Maize meal	3 lbs. Unbol'd Bar-	1 lb. Linseed

or X	or Y	or Z
6 lbs. Clover hay	8 lbs. Clover hay	10 lbs. Aftermath
7 lbs. Barley straw	43 lbs. Potatoes	4 lbs. Oat straw
70 lbs. Beets	5 lbs. Bran meal	20 lbs. Potatoes
2 lbs. Linseed	¼ lb. Rape seed oil	20 lbs. Brewer's grains
3 lbs. Bean meal		1½ lb. Rape seed
2 lbs. UnboltedRye		2 lbs. Malt sprouts

VI.—Fodder for Store Sheep.

Aa	or Ba	or Ca
15 lbs. Barley straw	9 lbs. Clover hay	9 lbs. Clover hay
9 lbs. Wheat chaff	12 lbs. Barley straw	14 lbs. Wheat straw
13 lbs. Potatoes	27 lbs. Potatoes	23 lbs. Potatoes
3 lbs. Rape cakes		

or Da	or Ea	or Fa
17 lbs. Oat straw	22 lbs. Pea straw	15 lbs. Meadow hay
9 lbs. Clover hay	4 lbs. Meadow hay	8½ lbs. Clover hay
28 lbs. Beets	11 lbs. Potatoes	12 lbs. Oat straw

or Ga	or Ha	or Ia
12 lbs. Aftermath	10 lbs. Clover hay	19 lbs. Barley straw
10 lbs. Pea straw	15 lbs. Oat straw	5 lbs. Clover hay
7½ lbs. Wheat straw	15 lbs. Potatoes	40 lbs. Beets
		1 lb. Rape cake

VII.—Fodder for Fattening Sheep.

Ka	or La	or Ma
6 lbs. Timothy hay	7 lbs. Meadow hay	15 lbs. Esparsette hay
4 lbs. Clover hay	5 lbs. Clover hay	
38 lbs. Potatoes	40 lbs. Beets	30 lbs. Turnips
3¼ lbs. Rape Cake	1 lb. Rape seed	4 lbs. Rye bran
6 lbs. Crushed Maize	4 lbs. Bean meal	1 lb. Linseed
2 lbs. Bean meal	6 lbs. Crushed Barley	5 lbs. Crushed Barley

To some persons these mixtures may seem complicated. They are, however, useful examples of the ways in which the strictest economy is practised. We are rapidly approaching the point where we shall be compelled, as European farmers have long since been, to economize in such ways as these.

From what has been said here, let us not fail to carry away this main idea. A great deal of food, which is ordinarily considered very poor, is really very valuable. It is poor only because it lacks nitrogen. To realize its full worth for fodder, other foods, richer in nitrogen, must be added to it. In this way cheap mixtures may be made rich enough for all purposes of feeding.

There is one more important point in this connection. The economy of this process does not end with feeding. Our lands need nitrogen in manure as much as our cattle do in their food. If we use more nitrogenous fodder, we shall have richer manure and larger crops.

One of the chief defects of our agriculture is the want of nitrogen in food and in manure. To remedy this, we need to use waste nitrogenous products, and to cultivate beans, peas, clover, and other crops, rich in nitrogen. Especially let us have more clover, as the quickest and most available resort.

Voices from the Bee Hive.

INTERPRETED BY M. QUINBY, ST. JOHNSVILLE, N. Y.

If the flowers yield abundantly, we need to be fed but little. On no account allow us to suffer until the flowers yield plentifully. Clover may not yield much until some time in June. Strong hives sometimes starve from the failure of honey in flowers, when there was just enough in the hive to feed a large brood and get it sealed over. When we are in any way stimulated to rear a large brood, we must not be neglected afterwards. Very often there is a dearth of honey between fruit blossoms and clover. Sometimes an extra stock, with honey sufficient early in the season to rear an ordinary number of workers, and even a brood of drones preparatory to swarming, is overtaken by a scarcity, when the drones will be sacrificed, and occasionally when the dearth is prolonged, the just hatched young workers also; even if we all do not starve at such a time. If we have a plenty of honey, and are weak in numbers, we increase moderately. In such a case, having honey on hand to carry us through this dearth, and continuing to increase moderately without any stoppage, we are ready to swarm earlier than those that had used their honey to rear early drones. Whenever we are stimulated by any means to rear early brood, we must be watched carefully. It will not do to see us flying thickly, and guess we are getting honey. Examinations need to be made within the hive, combs taken out, and cells looked into—all that are interested in this part, have movable combs. If there is sealed honey, all are safe from starving for several days. Be sure and keep a circle of cells containing honey, all the time outside the brood. It need not always be sealed over, but it should be there. If we are examined in the middle of the day, when honey is scarce, be careful and not keep the hive open unnecessarily long, because outsiders may be disposed to rob. We can be fed with Van Dusen's feeder, the most conveniently of any. Let this fact be impressed, that we act according to circumstances, very like the human subject. If the flowers yield honey, and the weather is suitable, we collect it; if one takes what we have done, as indicating what we will do under different circumstances, he will often fail in his expectations.

It is not too late to move us yet if we are taken a mile or more. If we are crowded, and the weather is warm, give us plenty of air, and a sponge containing water. Iron wire cloth is best to fasten us in the hive.

There are some strains or breeds of bees much superior in industry to others—both black and Italian. We cannot say how such are to be distinguished except by their thrift. Do not take the lightest and brightest Italians to be always the best workers, but see what the ordinary swarms do. Those that swarm first, and accumulate stores the most rapidly, are the ones to breed from. If one hive throws out a swarm early, and accumulates stores, and another equally strong, does not keep pace with it, by a few weeks, when both had an equal chance, the first is the one to propagate from. Watch closely, and see which is to be preferred. The rearing of queens will be given hereafter. [A large part of Mr. Quinby's article omitted for want of room.—ED.]

The Great Swine Trade at the West—Interesting and Important Figures—"Hard Times."

According to the reports submitted to the Cincinnati Chamber of Commerce, the whole number of Hogs packed in western towns the past season, amounted to over five and a half millions (**5,537,124,**) an excess of **343,314** *over any previous year!* As prices of pork and lard have been well maintained, the farmers producing these five and a half millions of hogs, and the corn that fed them, have little cause to complain of "hard times"—especially as they have been able to buy all kinds of manufactured goods and family supplies cheaper than at any other period in twelve years. An intelligent friend from Iowa recently informed us that, owing to the high value of pork and lard, the farmers of that State were, *generally*, better off than ever before. Those raising wheat alone were less favored, comparatively. [The largest sufferers from "hard times" have been among those who have been thrown out of employment directly or indirectly by the cessation of railroad building, in which an average of over a Hundred Million Dollars a year were expended prior to the "panic of 1873"—much of this money coming from foreign sources, as investments in bonds and stock. Of course, the eastern manufacturers, and the traders, who supplied the iron for these railroads and the articles worn and used by these builders, have suffered from the cessation of demand for their products, and this has thrown out of employ another large class of persons. If any one will trace out these hundreds of millions, all through the channels of trade, he will readily see that the effect has been felt in almost every town and hamlet throughout the whole country, and that in the aggregate several millions of persons have been the sufferers.]

The following table gives the number of hogs annually packed at the West during 26 years past:

1874-5	5,537,124	1866-7	3,490,791
1873-3	5,456,004	1858-9	2,465,552
1873-4	5,383,810	1864-5	2,422,779
1871-2	4,782,403	1859-60	2,350,322
1862-3	4,069,520	1857-8	2,210,778
1870-1	3,623,404	1853-3	2,201,110
1863-4	3,261,105	1861-2	2,155,702
1861-2	2,936,666	1854-5	2,124,404
1867-8	2,78 ,084	1856-7	1,818,778
1869-70	2,635,312	1865-6	1,785,956
1853-4	2,534,770	1849-50	1,652,220
1868-9	2,499,873	1850-1	1,332,867
1855-6	2,489,302	1851-2	1,182,846
Total number packed in 26 years			**74,157,182**
Average per year			**2,852,200**

It will be noted that the past winter's packing exceeds by nearly 2,684,924 the average for the past 26 years. The following table gives the number packed the past winter at points where 10,000 or more were reported:

Chicago, Ill	1,690,348	Pekin, Ill	17,068
Cincinnati, Ohio	560,164	Lawrence, Kansas	17,000
St. Louis, Mo	462,246	Washington C. H., O.	16,338
Indianapolis, Ind	278,339	Greensburg, Ind	15,907
Louisville, Ky	273,118	Lacon, Ill	15,286
Milwaukee, Wis	248,197	Evansville, Ind	15,160
St. Joe & vicinity, Mo.	117,050	Delphi, Ind	15,140
Peoria, Ill	112,750	Columbus, Ind	15,077
Cleveland, Ohio	80,266	St. Paul, Minn	15,009
Des Moines, Iowa	74,017	Toledo, Ohio	14,474
Kansas City, Mo	73,500	Wilmington, Ohio	14,286
Keokuk, Iowa	72,000	Hagerstown, Ind	14,250
Quincy, Ill	55,808	Martinsville, Ind	13,960
Cedar Rapids, Iowa	54,600	Leavenworth, Kan	13,751
Dubuque, Iowa	53,500	Canton, Mo	13,000
Detroit, Mich	38,376	Omaha, Neb	13,000
Sabula, Iowa	37,318	Lafayette, Ind	12,830
Ottumwa, Iowa	35,000	Nashville, Tenn	12,300
Terre Haute, Iowa	32,000	Chillicothe, Ohio	12,238
Richmond, Ind	27,700	New Castle, Ind	11,685
Franklin, Ind	27,406	Wabash, Ind	11,640
Gosport, Ind	25,571	Sioux City, Iowa	11,296
Galena, Ill	24,000	Marion, Ind	11,000
Circleville, Ohio	23,486	Ripley, Ohio	11,000
Council Bluffs, Iowa	20,000	Springfield, Ill	10,500
Xenia, Ohio	18,842	Burlington, Iowa	10,150
Muncie, Ind	18,100	Barry, Ill	10,000
Charleston, Ill	17,202	Davenport, Iowa	10,000

By adding the amounts in this last table, we have the following numbers by States:

Illinois	1,952,962	Wisconsin	248,197
Ohio	751,091	Michigan	38,376
Missouri	665,796	Kansas	30,751
Indiana	545,769	Minnesota	15,000
Iowa	377,901	Nebraska	13,000
Kentucky	273,118	Tennessee	12,300

This accounts for only 4,924,257 hogs packed in the 56 towns enumerated, leaving 612,867 for towns packing less than 10,000, in the different States.

The comparative average net weights of hogs, and the average yield of lard per head, for the two seasons, 1873-4 and 1874-5, are as follows:

	1873-4		1874-5	
	Weight of Hogs.	*Lard.*	*Weight of Hogs.*	*Lard.*
Ohio	233.49	39.01	222.73	39.36
Indiana	207.22	29.66	206.80	29.83
Illinois	219.02	37.23	213.76	36.66
Iowa	204.67	33.88	198.67	33.52
Missouri	207.01	33.86	189.74	29.19
Kansas	220.64	35.83	171.63	25.43
Wisconsin	210.89	30.50	212.48	31.62
Minnesota	229.36	36.41	237.46	29.83
Nebraska	214.65	34.59	193.96	29.88
Kentucky	213.87	29.66	209.60	29.70
Tennessee	200.42	34.16	192.39	29.20
Michigan	234.02	38.26	234.27	35.16
Miscellaneous	207.94	31.03	197.08	28.27
General Average	214.97	35.02	209.77	34.20

The price of pork per 100 lbs. net, for the two seasons, was for 1873-4, $5.13, and for 1874-5, $8.33, a difference in favor of the season just past of $3.20 per 100 lbs. The average value of lard for the two years, was for 1873-4, 9c., and for 1874-5, 14½c. The total value of the western hog crop, pork and lard together, was as follows:

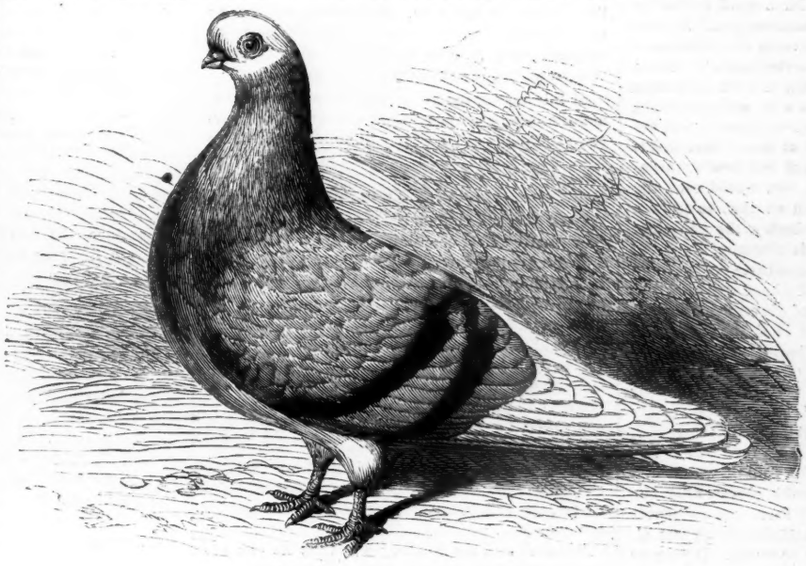
	Pork.	*Lard.*	*Value.*
1874-5	1,167,639,457 lbs.	190,390,607 lbs.	$97,388,826
1873-4	1,175,126,971 "	191,444,035 "	63,827,215
Showing an *increase* in value in 1874-5 of			**$33,511,611**

all of which has gone into the pockets of the farmers of the Western States, during the past winter.

The quantity of corn represented by these aggregate productions of pork and lard, may be estimated very nearly by taking 6 pounds of pork as an equivalent of one bushel of corn. On this reasonable estimate, the quantity of corn fed would be, in 1873-4, 227,584,596 bushels, or about one-quarter of the whole crop, producing an average value of 30½c. per bushel, and in 1874-5, 226,513,932 bushels, or something over a quarter of last year's deficient crop, producing an average value of 50c. per bushel. The stocks of hogs on hand the last seasons were, in 1873, 21,193,300 head; 1874, 19,927,600 head; 1875, 17,245,700 head.—The large falling off in the stock of live hogs with which we have begun the present season, is a fact worthy of note by pork producers.

The Baldhead Pigeon.

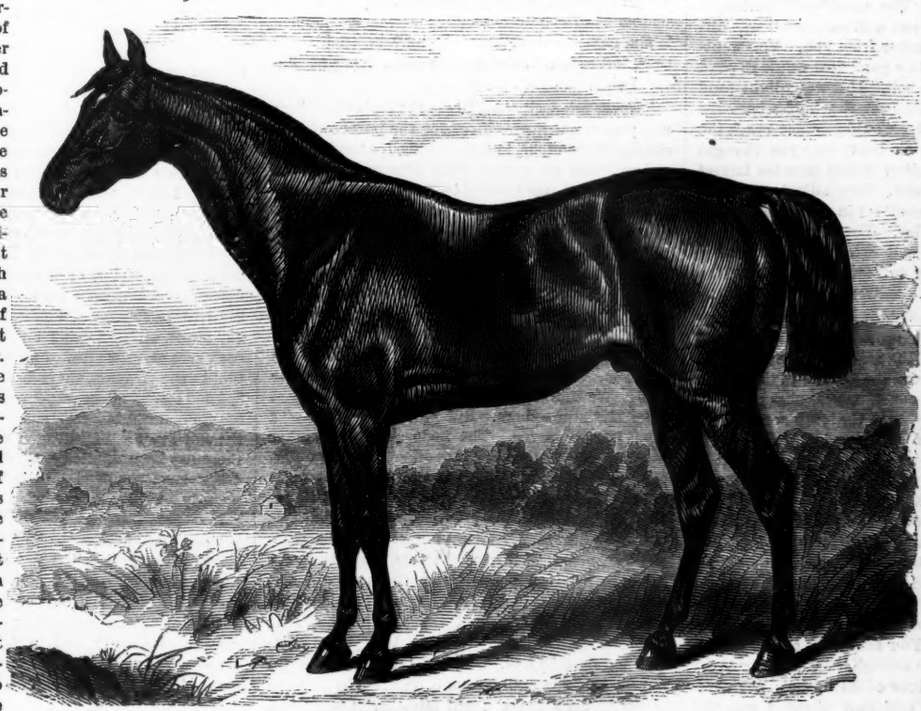
The portrait given herewith is one of a "Baldhead," which was bred in 1872, from a blue cock and a silver hen, and is an extremely good specimen of this beautiful class of pigeons. This bird has won many first prizes in England, amongst which were those at the Crystal Palace and Birmingham exhibitions. Baldheads are of various colors, blue, black, red, yellow, and the breeding of this variety is a favorite amusement with many pigeon fanciers, both here and in England. By care in selecting for breeding, they are now produced in great perfection and beauty. They are strong flyers, and their absurd antics on the wing as they tumble about in the air, whirling over and over, are very ludicrous. A correspondent of "The Country," from which the portrait is selected, states that they are very good breeders, excellent nurses for their young, easy to keep, and very hardy, living in perfect health until ten to twelve years old. These birds are becoming more popular than they have hitherto been, and the entries of Baldheads in the pigeon shows, gradually increase year by year. That they possess a certain elegance and beauty of feather, sufficient to make them attractive to fanciers, is readily seen by reference to the illustration.



THE BALDHEAD PIGEON.

A Western Stock Farm.—Horses.

A few years ago the idea of establishing a large stock farm upon the plains in the western part of Kansas, where thorough-bred stock of the finest character should be kept, would have seemed too absurd for serious consideration. But the experience of the past few years has greatly added to our knowledge of the climate and capabilities of those vast areas of land, which are covered with a perennial growth of grass of the most nutritious character. Two years ago a large tract of land in Ellis Co., Kansas, was purchased by Mr. George Grant, and stocked with a number of sheep and cattle, as an experiment. The first winter's experience proved that there was no reason why the enterprise should not be successful, and the next season a large addition was made to the stock. Some fine Short-horn and polled Angus bulls were added to the herd, and the flocks were increased to 7,000 head of native ewes, and a sufficient number of thorough-bred Lincoln, Leicester, Cotswold, Southdown, Shropshire, and Oxfordshire rams. All this stock has passed through last winter, not only with safety, but with the greatest ease and comfort, and is now in the best condition. Five hundred head of Cherokee cattle wintered in the open prairie, with the loss of only five yearlings, and there have been only ten days, upon which the thorough-bred cattle have not pastured in the open fields; these were the only days upon which the less hardy cattle needed shelter. The sheep have improved remarkably in health, and there has been no appearance of disease of any kind. The half-bred lambs yield a greatly improved fleece; the fleece of the half-bred Leicester being of the best quality, although not of the greatest length. The samples of wool which we have inspected, are of good quality, and rare evenness. The Lincoln cross produces a long, coarse, combing-wool; the wool of the Cotswold cross is finer, and that of the Leicester cross is finest. In addition to this stock, Mr. Grant has procured a fine thorough-bred imported stallion for use upon the farm. This is Flodden, a bay horse, 7 years old, sired by the celebrated Thormanby, whose death recently occurred in England. A portrait of Flodden accompanies this article. Flodden's pedigree includes Bay Middleton, winner of the Derby in 1836; Trumpater, who was the sire of seventy winners, King Herod, who produced 497 winners, whose prizes amounted to over a million of dollars, and some other famous horses. The introduction of this stock, and the successful settlement of the extensive tract of land owned by Mr. Grant, are of great benefit to the State, and to all the territory adjacent, which is subject to the same conditions of climate. The crops grown are chiefly rye, oats, and lucern; of the last 300 acres will be sown the present season. A considerable town, named Victoria, has grown up in the center of Mr. Grant's tract, and some fine residences of sandstone, which is plentiful in the neighborhood, have been built. The locality is watered by the Victoria river, and abundant water is procured from wells at a depth of 16 to 40 feet. These plains, which have fed countless buffaloes for centuries, and are covered with the buffalo-grass, afford fine pasturage for stock, but are not suited for general cultivation, or ordinary farming.



"FLODDEN."—OWNED BY GEORGE GRANT.

THINNING CORN.—Prof. Roberts, of the Cornell University made some experiments in growing corn upon the College farm last season, the results of which are valuable. He planted three plots of three-sixteenths of an acre each with corn, and thinned the hills in one lot to three stalks, another to four stalks to a hill; the third was not thinned. The first plot yielded at the rate of 160 bushels, the second 125 bushels, and the third 106 bushels (of ears) to the acre. Mr. Roberts states, as the result of many experiments prior to these, at the Iowa Agricultural College, that the heaviest crops of corn were made by growing three stalks to a hill, and that two stalks to a hill will produce more corn than five stalks. If every stalk produces an ear, and corn is planted three feet apart each way, there will be nearly 100 bushels of shelled grain per acre. To grow maximum crops of corn then, it is only necessary to grow one ear upon a stalk, and ears of such a size that a hundred of them will make a bushel of grain. In view of this it is strange that with so prolific a grain as corn, a yield of 100 bushels per acre should be considered as something almost impossible to be obtained.

Walks and Talks on the Farm.—No. 136.

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"I do not understand," said the Judge, "your position in regard to clover. I would like to have you on the witness stand with a good farmer to prompt a sharp lawyer in examining you. In your direct testimony you say 'clover is the grand renovating crop of American agriculture!' 'Raise your own clover-seed and sow it with unsparing hand?' 'You should never sow wheat without seeding it down to clover.' Nay, more," said the Judge, "you even go so far as to say that this is not enough, and that instead of the common rotation, corn, barley, and wheat, you would seed the barley with clover. You tell us that to grow a maximum crop of wheat or barley, the one chief thing that the soil requires is nitrogen. You tell us that a crop of clover contains three or four times as much nitrogen as a crop of wheat or barley, and that when we grow a crop of clover and plow it under or feed it out on the land, the soil is supplied with what wheat and barley so much need, nitrogen. Now all this is clear enough, and I thought I understood your views. But on your cross examination you say 'Clover cannot create nitrogen, and there is no evidence that it gets it from the atmosphere.' You were then asked this question: 'Suppose you had a field of wheat, half of which was seeded down with clover, after the wheat was off, the half where there was no clover was plowed. On the other half the clover was allowed to grow without being pastured. It grew so large in the fall that some of the clover plants headed out. The frost of winter cut down this clover, and it formed a mat of manure on the surface. The next spring the other half was plowed again, and summer fallowed in the old-fashioned way. The clover on the other half was allowed to grow, and did grow very large and rank. The second week in June this heavy crop of clover was plowed under, and the land was kept mellow and free from weeds by the free use of the cultivator and harrows, and finally the whole field was sown to wheat in September.' Now which of those two parts of this field would be likely to produce the best crop of wheat? The question," continued the Judge, "was plain and well put, but it was difficult to get a direct answer from you. You wanted to qualify. You said a good deal would depend on the character of the soil. If it was a light sand or sandy loam, you thought the half where the clover was plowed under would produce much the best wheat, but if it was a heavy clay you thought *perhaps* the summer fallow would give the largest yield. You did not know. You talked about the mechanical effect of the clover in ameliorating and lightening this heavy clay. You thought the clover might keep it warmer and drier, and that on the whole the chances were in favor of the half which had grown the clover. Still you would not say."

"You were then asked how much nitrogen such a crop of clover, taking roots and all, would contain. You replied, 'If the growth in the fall which rotted on the ground, and the growth in the spring with the roots, were equal, taken altogether, to four tons of clover hay, then the crop would contain about 200 lbs. of nitrogen.'" "You were then asked how much nitrogen a crop of wheat of 50 bushels per acre would contain? You said, 'Wheat contained 1.80 per cent of nitrogen, and wheat straw 0.65 per cent.' You said furthermore that such a crop of wheat would give at least 100 lbs. of straw to each bushel of wheat, and consequently the crop would contain 54 lbs. of nitrogen in the grain, and 32¼ lbs. in the straw, or the whole crop of wheat of 50 bushels per acre would contain 86¼ lbs. of nitrogen. You said such a crop of clover contained nitrogen enough, (200 lbs.), for three crops of wheat and straw of 33 bushels per acre. And you had before said that nitrogen was the chief thing which we required to grow large crops of wheat, worth in fact, from 25 to 30 cents per lb. And yet you hesitate to say whether the part of the field on which this large crop of clover was plowed under as manure, would or would not produce a greater crop of wheat than the other half where no clover was plowed under, and no manure of any kind applied."

"If you will allow me," I said, "I will explain."—But the Judge stopped me. "Answer the questions, sir, which are put to you. You admit that you have plowed under clover and roots which contain 200 lbs. of nitrogen per acre. Now please say, yes or no, whether that soil does not contain 200 lbs. more nitrogen per acre than the land where no clover was grown or plowed under?"—"No."

At this answer the Judge, the Squire, the Deacon, and the Doctor had hard work to repress their surprise and indignation. They thought I was trifling with them. And the Judge asked in a severe tone, "What, then, has become of this 200 lbs. of nitrogen?"—"It is in the soil."—"And yet you say the soil does not contain 200 lbs. of nitrogen. You plow under clover containing 200 lbs. of nitrogen, and you say it is then in the soil?"—"Yes. Some of it still undecomposed in the clover, and some mixed with the soil. I do not suppose there has been any of it lost."—"Please explain yourself, sir," said the Judge, with a frown.—"That is what I have been trying to do for some time, but you stopped me. If I take $200 out of my left hand pocket and put it into the right hand pocket, I become no richer by the change. I have not got $200 more money, and yet I have just put $200 into my pocket. And so if a crop of clover takes 200 lbs. of nitrogen out of the soil and you plow under the clover, the soil becomes no richer in nitrogen by the operation."

"Well," said the Squire, "why then do you advocate growing clover? Why do you call it the great renovating crop of American agriculture?"—"I speak of it as the great renovating crop of our agriculture, because it seems specially suited to our climate and circumstances; and because, especially on our limestone soils, it grows with astonishing vigor. If our land is dry, clean, and well cultivated, we can often grow large crops of clover with no manure except a bushel or two of plaster per acre. The turnip has been called the great renovating crop of British agriculture, its sheet-anchor. But it is a crop which requires a large outlay in labor and manure. On many English farms, no matter how heavily they are manured, clover can seldom be grown to advantage oftener than once in six, eight, or ten years. It may be so here in time, but as long as I can grow good crops of clover, I shall continue to do so."

"Never mind all that," said the Judge, "tell us *why* you would grow clover for the purpose of enriching the land, or, in other words, for the purpose of furnishing the cereals with nitrogen when you say that the clover returns to the soil no more nitrogen than it had taken out of the soil?"—"Because experience, observation, actual experiment, and true science, all tend to show that a crop of clover, when plowed under or fed off on the land, actually does enrich the soil for wheat and barley, and I have no doubt for oats, rye, corn, and potatoes also."

"Now you are getting on to one side of the question. We, too, know that clover enriches the land. We think it does so by getting nitrogen from the atmosphere. But you deny this."—"I say it is not proven. The facts are all the other way, and are susceptible of another and very different explanation. I believe in clover. I grow more of it than any of you. But your theory of its action will not bear the slightest examination. It will not hold water. And an erroneous theory, especially a fundamental one like this, leads to grave errors in practice. Farmers sometimes grow clover, make it into hay, and sell it, the clover roots help them to grow a fair crop of wheat. This they sell; and they sell corn, and oats, and barley, and potatoes, and timothy hay. They say, 'If we do run down our land we can easily bring it up again by growing clover.' They make a sad mistake. Clover is a crop for the good farmer, not for the poor farmer. It gathers up and utilizes the nitrogen, phosphoric acid, potash, etc., already in the soil. It does not get them from the atmosphere."

"Go on with your explanation, sir," said the Judge.—"The Deacon and I have talked this matter over again and again."—"Never mind what you have said to the Deacon. Keep to the point. We want to get to the bottom of this subject. Let me ask you again, why, if clover does not get nitrogen, phosphoric acid, and potash from the atmosphere, you so persistently advise it as a renovating crop?"

"Because clover saves these important elements of plant-food from running to waste. They are in the land. A certain amount of them are held in solution by the water which always exists in the soil. Wheat, and barley, and probably oats, corn, potatoes, and grass, require a *stronger solution* than clover. We know that wheat often yields only half a crop, simply because it cannot find in the soil sufficient nitrogen and phosphoric acid, and yet clover, on the same soil, finds much more nitrogen, phosphoric acid, and potash than is required to produce the heaviest crop of wheat. And so I say grow as much clover as possible, and either plow it under or feed it on the land; or make it into hay, feed it to cows, sheep, horses, or hogs, and take back the manure to the land. Then the wheat, barley, and other crops can get hold of the plant-food which they require. When you plow under a crop of clover you do not increase the quantity of nitrogen, phosphoric acid, potash, etc., in the soil. It was there before the clover grew. But you concentrate these important fertilizing substances. You gather them up into the roots, leaves, and stems of the clover, and when these decay in the soil the roots of wheat, barley, etc., can find food rich enough for the rapid and healthy growth of these crops."

Two years ago, the Deacon and I were talking about Mr. Lawes' remarkable experiments on barley. (Walks and Talks in *American Agriculturist*, 1873, page 134.) He has now grown 23 crops of barley in succession on the same land. Two plots have been left continuously without manure of any kind. The following table shows some of the most important results:

MANURES PER ACRE.	*Average yield per acre for 23 years.*
1. No Manure	21 bush.
2. Superphosphate of Lime	24¼ "
3. Superphosphate and Ammonia or Nitrate of Soda	49 "
4. Superphosphate and Ammonia and Salts of Potash, Soda, and Magnesia	48⅛ "
5. 14 Tons Barnyard Manure	48⅘ "

This little table is worthy of much more consideration than we can now give it. I must be very brief. Look first at No. 2 and No. 3. The only difference between the two plots is that No. 3 has had about 50 lbs. of nitrogen applied annually per acre in the form of sulphate of ammonia or nitrate of soda. This has doubled the crop. Then look at No. 5. The 14 tons of manure applied each year contains about 200 lbs. of nitrogen, and an excessive abundance of every element of plant-food, and yet we get no more barley than from No. 3. In other words, 50 lbs. of nitrogen in an available condition, give as great a crop as 200 lbs. of nitrogen in barnyard manure. The crop of barley in grain and straw, on plot 3 and on plot 5, removes from each acre about 25 lbs. of nitrogen per annum. So that in the 23 years, there has been applied to plot 3, 1,150 lbs. of nitrogen per acre. The crops grown have taken out 575 lbs., and there has been left in the soil 575 lbs. of nitrogen per acre. On plot 5 there has been applied 4,600 lbs. of nitrogen. The crops have removed 575 lbs., and there is consequently 4,025 lbs. of nitrogen left in the soil.

Now recollect that 100 lbs. of *available* nitrogen per acre would make the land so rich that the crop would probably be "as flat as a pancake." But the enormous quantity of nitrogen which has accumulated in the soil from the annual application of 14 tons of manure per acre, produces no over luxuriance of growth, and in fact gives a no larger crop now than 50 lbs. of nitrogen applied in the form of nitrate of soda or sulphate of ammonia.

What has become of this 4,025 lbs. of nitrogen? Mr. Lawes has shown that a portion of it is washed out by rains. But there is undoubtedly a large amount lying in the soil, in such a form that barley and wheat cannot take it up. But *clover can take it up.* At any rate to a much greater extent than

wheat and barley. The Deacon suggested this idea two years ago. And I am happy to say that Mr. Lawes has given us the results of an interesting experiment which shows that the Deacon was right.

The field on which this experiment was made has been cropped as follows: 1864, red clover; 1865, wheat, with artificial manures; 1866, mangles, with dung and artificial manures, crop removed from the land; 1867, wheat, unmanured; 1868, oats, with artificial manures; 1869, '70, '71, '72, barley with artificial manures. In 1872 half the field was seeded down with clover on the barley. In 1873, the half not seeded down was sown to barley again, but without manure. The other half was in clover. The barley yielded 31 bushels per acre. The clover yielded 3 tons and 48 lbs. of hay per acre. The next year, 1874, the whole field was again sown to barley without manure of any kind. The yield after the barley was 32¾ bushels per acre; after the clover, 58 bushels per acre.

This result pleases the Deacon, and ought to rejoice the heart of George Geddes. The 3 tons of clover hay have taken out of the soil 150 lbs. of nitrogen. This hay, fed to sheep, or cows, or horses, would give us manure containing about 140 lbs. of nitrogen, or as much as is contained in five or six large crops of wheat or barley. And the nitrogen left in the roots of the clover gave an increase of 25¾ bushels of barley per acre.

May I not be excused, therefore, for so repeatedly pointing out the advantages of growing clover and consuming it on the farm? We get in the two years from this field, 63¾ bushels of barley per acre, when barley is sown after barley; and 58 bushels of barley on the other half, and 3 tons of clover hay. Surely 3 tons of clover hay is worth much more than 5¾ bushels of barley. But do not sell the clover hay. I have not time now to say why, but do not do it. One more remark and I have done. Instead of sowing wheat after barley, as most of us here do, seed the barley down with clover. We shall never get rich by growing half crops of wheat and exporting them to Europe. Better grow more clover and raise more beef, pork, mutton, and wool.

We have had "good luck" with our lambs this spring. I do not like the word, but there seems to be more or less "luck" about getting good lambs. There is a cause for it, but it is not always easy to find out why lambs come weak in one case, and strong and vigorous in another. I have always had the strongest and healthiest *grade* lambs. I do not recollect ever losing more than one during the last five years, and that was an accident. But we have always had more or less trouble with the thoroughbreds. The grades would in all cases get up in a few minutes and take care of themselves. With the thoroughbreds it is not unfrequently necessary to turn up the ewe and let the lamb lie down, while we held his head to the teat and pressed a little milk into his mouth before he would suck. These sheep are high bred. They have for generations had all their wants supplied. The object of the breeder has been to get sheep with little offal. He wanted as little as possible of the force or energy of the lambs to be used for any other purpose except to convert the food into mutton and wool. He succeeded to an extent which is truly astonishing to any one who has not studied the subject. We can easily get a lamb to grow as much in six months as many common sheep do in three years. If the lambs are a little "stupid," we must bear with them. We have made them what they are. If a farmer is not prepared to give them the necessary care, he should not raise "improved" thoroughbreds. For my part I like the business. I like to feel that these animals are artificial productions, and that they need intelligent care and attention. I like to see them grow. I like to sell a lamb for $50, and to feel that in the hands of a good farmer he can be made to bring back ten times the money. I have thought of all this when I have been sitting up at night with a ewe and "fussing" over a weak or chilled lamb. Randall says lambs that will not take care of themselves should be suffered to die. This would be a good theory if our object was to get slow-growing, hardy sheep, that produce nothing but wool, and little of that.

It ought to be understood that these high bred cattle, sheep, and pigs cannot be raised as easily as common stock. "Why, then, do we want them?" We want them to cross with common stock. Take a common sow and breed her to a high-bred boar, and you will get pigs hardier and healthier than if you used a boar of no breed or pedigree, and the pigs will be worth at least a dollar a head more at weaning time, and from $5 to $10 more, with the same feed, at killing time. In a large herd, or if the neighbors patronize him, such a boar may be the father of a thousand pigs. I do not say it pays the *breeder* to raise such a pig, but I am sure it pays to use him after he is raised. And so with sheep, I do not want anything better, hardier, or healthier than such grade Cotswold-Merinoes as I have been raising for five or six years. I do not want better mutton, and the wool brings a higher price than any other. The Deacon was looking at my flock the other day. We have six or eight of the old Merino ewes still left. We call them the grandmothers. "There, Deacon," I said, "is the grandmother; there the mother, and there the son. The son is not quite a year old. Let us put him on the scales." We caught him and examined his wool. He has two crosses of Cotswold blood, the fleece is close and heavy, nearly as long, and somewhat finer than the thorough-breds. The Deacon thought he would weigh 150 lbs. We put him on the scales, and he weighed plump 165 lbs. at less than a year old.

We then caught a two-year old grade ewe, a perfect beauty. Her grandmother was a Michigan sheep, with probably some Leicester blood in her. A common sheep that cost me 3 cents a lb. Perhaps she weighed 80 or 90 lbs. The mother was sired by a thorough-bred Cotswold, and this ewe also; so that she has 75 per cent of Cotswold blood, and 25 per cent of common Leicester-Merino. She pulled down the scales at 202 lbs., and she has had precisely the same feed as the "grandmother," which will not weigh more than 75 or 80 lbs.

A correspondent at Union, Oregon, writes to the *American Agriculturist*, and the editor refers the letter to me. The letter says: "Times are dull here; farm produce is low, wheat 50 cents a bushel, and other crops in proportion. One of the principal ways for farmers to raise cash is to breed and fatten hogs to sell to Chinamen, who work in the neighboring mining camps. The Chinamen must buy the hogs alive, and prefer small ones, from 75 to 150 lbs. We propose to go into the business of raising such pigs, and submit our plan to you for your advice. Have the sows come in say first of March. As soon as the pigs are old enough to wean, put them up and feed them all they will eat of milk, grain, etc., until about the 15th of July, or harvest time, when they should bring a good price. Have the sows come in again early enough in the fall for the young pigs to get the benefit of the stubbles, where they can run as long as they do well. Then shut up to fatten on barley, cooked or ground, until about the 1st of March, when they bring the best price in the China market. We shall use a thoroughbred boar on common sows. What should such pigs weigh, and how much would they consume, and what do you think of our plan? Farmers say there is nothing to be made in hogs at present prices, we think if the common way of feeding and breeding will pay, ours certainly will." You do not say what such choice pigs as you propose to raise will bring in the "China" market. If "John" knows what good pork is—and we suspect he does—and is willing to pay what it is worth as compared with the pork from semi-wild or half-neglected hogs, we think there is money in the business. But you will want a good man to take care of the pigs. Much will depend on this. If you keep, say 50 breeding sows, it will require the entire time of a man, and in the spring and fall he should have a bright boy to help him look after the sows with the young pigs. Your March pigs should weigh from 75 to 100 lbs. in July. The pigs after weaning, will eat, at two months old, about one pound each per day of corn, barley, or wheat. Two weeks later, they will eat about a pound and a half each per day, and the next month or six weeks they will probably consume on the average from 2 to 2½ lbs. each per day. The more you can get them to eat, the better. For this purpose it is desirable to cook the food and to feed it with good judgment. For instance, you will probably be short of milk, and you must use the little you have to induce the pigs to eat an extra quantity of food. My own plan is to feed all the cooked corn meal and middlings the pigs will eat, and then after they have taken all they will of this food, give them some more cooked mush mixed with a little milk. You should get a very fine boned high-bred boar, such as the Suffolk, Essex, or small Berkshire, and probably it will require two or three crosses from your common sows before you get pigs as fine as the Chinamen have been accustomed to. But even the first cross will be a vast improvement on the common hog. The improved breeds of pigs owe much of their early maturity, smallness of bone, and offal, and fattening qualities, to an infusion of Chinese blood. It reduced the size, but improved the quality of the coarse old fashioned English hog.

The Farm Blacksmith-Shop.

A well appointed blacksmith-shop for farm work can be procured for about $50. This may consist of a portable forge, an anvil, a vise, and the usual hammers, tongs, etc., which form the kit of tools. With these a farmer may make a bolt, or a nut, or mend a chain, or do any of those small repairs which are continually needed upon a farm. Now that machinery is coming into such extensive use, the means of repairing any trifling break, or replacing a lost bolt or nut, must of necessity be at hand. To have a mower, a reaper, or a threshing machine, break down when the hurry of work is at the greatest, may frequently occasion a loss equal to a large portion of the cost of the appliances for making an immediate repair at home. We have known a farmer in such a case to mount a horse and ride several miles to get a bolt made, that could have been made at home in ten minutes, if the means were ready, meanwhile a dozen men and eight or ten horses were idle for half a day. The same will apply to country mills, both saw and grist mills, which are often disabled for half a day or more by some trifling mishap, the real cost of which is nothing as compared to the indirect damage from delay. Some years ago portable forges were introduced chiefly for army use, but they were found of such great value that they were speedily adopted by mining explorers, railway engineers, lumberers in the back woods, and others who needed light work done at a moment's notice, and have also found their way into farm work-shops. At least, having found their value in all the first mentioned cases, the writer found one indispensable in his farm work-shop, and certainly saved its cost in one year's use. Within the past year or two great improvements have been made in these forges; a rotary fan, instead of a bellows, has been affixed to them, and our illustrations (figs. 1 and 2) exhibit them as they are now made by the Empire Forge Company, of Troy, N. Y. That shown in fig. 1 costs but $27, and is a very convenient one for farm use, or for light mechanical work. It is of such obvious value to the farmer that we apprehend it is because they, as well as their low cost, are not widely known, that almost every farm work-shop has not one. This cheap forge (No. 10) is made very light but strong, with wrought iron legs, and can be readily lifted and carried from place to place. It weighs 90 pounds. The blast is supplied by a geared rotary blower, and a welding heat can be got up in a very short time. There are no belts or leather to become hardened, cracked, and useless, by exposure. It may be carried into the field along with the reaper, or into the quarry, or the clearing, where drills have to be sharpened, and may be left out of doors without injury. The wearing parts are made of bronze, and have not required replacing after many years of work. Fig. 2 is a larger forge (No. 11), made of cast-iron, with closed top and doors to shut around the fire, and to which a stove-pipe may be affixed to carry off

sparks and prevent danger from fire. This is a very desirable forge, as it may be attached to a chimney in the work-shop, and may be used near a barn at any season without the slightest danger. It

Fig. 1.—SMALL FORGE (No. 10).

weighs 160 pounds, and costs $35. It may be had with a tight and loose pulley, to be run by horse-power as well as by hand. The blast of these forges is strong enough to burn either charcoal, or anthracite, or bituminous coal, as may be convenient

Fig. 2.—LARGER FORGE (No. 11).

to procure. The other large furniture of the shop should be an anvil and a vise. These are as indispensable as the forge, and are useful for much work that does not need a fire. Small anvils and vises for farm use are made by Messrs. Fisher & Norris, of Trenton, N. J. The vise to be preferred is the "parallel leg" vise, shown at fig. 3, which always takes a firm square grip, whether the object held is large or small. It can be fastened to the work-bench by bolts, and a small size costs $8.00. The anvils used should be chosen for their solidity and the excellence of the face. Upon this latter greatly depends the ease with which work may be done upon it, as a light hammer will do as much work upon a good anvil, as a heavier one upon a poor one. These anvils are from 10 lbs. weight, costing $3.50, up to 90 lbs., costing $10.50, for light work, and from 100 to 800 lbs. for heavy work.

Fig. 3.—VISE.

Warming Milk for Butter.

At the various dairymen's conventions every device that promises to increase the yield of butter, or improve its quality, meets with a ready hearing, and is intelligently discussed. Among the topics considered at these meetings has been that of warming milk before setting, or "scalding," as it is generally spoken of. We can not here give the argument of those who recommend this treatment, it being nothing new, as the heating of the milk up to 120 degrees, or even more than that, has long been practiced in some of the best dairy districts in Europe. A visit many years ago to the Devonshire dairies, in England, where the famed clouted cream is produced by a method of heating, led the writer to adopt a similar plan in his own dairy. This plan was described at the meeting of the American Dairymen's Association, at Utica, in 1873, and has been probably adopted by some of those who were then interested in its description. But from the various inferior methods described at similar meetings the past winter, and from the numerous inquiries which were made by those who have no method at all, we have prepared the accompanying illustrations of the plan referred to. The general method is to place the pans upon the stove until the milk is warmed, but this obviously will only answer in very small dairies. Other methods are in use in some dairies where fancy butter is made, which are based upon the use of the kitchen stove, but these are all seriously objectionable, as requiring too much handling of the milk. What is wanted is a plan that can be operated in the dairy altogether, without help from the kitchen stove, except to procure from it a quantity of boiling water, with a heated iron, by which the temperature of the water is maintained. This is done by the use of the apparatus described in this article; this is not patented, and can not be, as it is the writer's own invention, and is here published for the first time, for the public benefit.

The purposes served by heating milk, are two-fold. All milk when drawn from the cow, possesses an odor more or less strong and disagreeable, as the food may have been strong-flavored—cotton-seed meal, or turnips—or as the surroundings of the cow stable may have been the reverse of pure and sweet; and under the most favorable circumstances, some odor is perceptible. If the odor is not allowed to escape, or is not removed, some portion of it remains in the cream and in the butter, giving it a disagreeable flavor, which can be easily detected therein by a sensitive palate. Again it is claimed that the cream from milk which has been heated, rises more rapidly and completely, and is thicker; and the milk remains sweet during a longer time in summer. These are very important advantages, and if the milk can be heated at a small cost, and with but slight trouble, they will amply repay both cost and trouble. The method consists in the use of a vessel of tin or galvanized iron, shaped like a large pail, as seen in the illustration, holding 12 or 14 qts. Upon the top of the pail, a common tin milk pan, holding some 10 quarts, is soldered, forming the top of the pail. At one edge of the pail, and beneath the pan, a broad lip is made, at the bottom of which is an orifice leading into the pail. A coil of tin-lined lead pipe, a quarter of an inch in diameter, is made to lead from the bottom of the pan on the top of the pail, to the tap at the lower part. The coil is fastened in the pail so that it is exposed in every part to the action of the hot water, which is poured from a kettle through the lip into the pail. A recess is made in the lower part of the pail, which is closed by a slide door, into which an iron heater fits snugly. The heater is a bar or piece of iron, not smaller than a common sadiron, without a handle, but furnished with two eyes or rings, by which it may be lifted into the recess made for it. This heater, which is shown in the figure, is made red hot, and is placed in its recess immediately after the pail has been filled with hot water. The slide door of the recess is then closed, and the pail can then be carried into the dairy for use. The milk, as brought from the cow-stable, is strained into the pan above the pail, and passes through the coil, in which it is heated up to 100 to 120 degrees, or even more, in proportion to its more rapid or slower passage. The milk escapes through the tap in a small stream, into pans or a second milk pail; a pail is better than pans, as when the milk is finally poured from

APPARATUS FOR WARMING MILK.

the second pail into the pans, it is thoroughly aired and freed from all remaining taint, besides it is easier to move a whole pailful of milk at once, than to move several pans at separate intervals. This plan of heating may be applied to the shallow pan or the deep can method of setting the milk.

Make Shoes for the Plows.

One of the reasons why plows are so often left in the field, after the plowing is finished, until they are wanted in some other place, is the inconvenience of

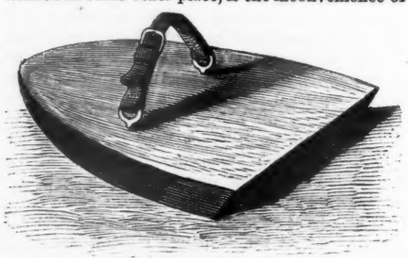


Fig. 1.—PLANK PLOW-SHOE.

moving them on the surface of the ground. They are certainly awkward to handle on the road or in a rough lane unless they are provided with a shoe; then they slip along without any difficulty. A

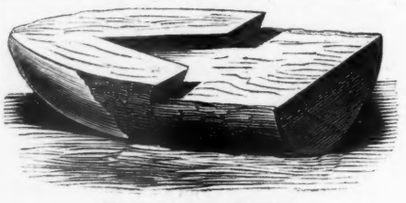


Fig. 2.—LOG PLOW-SHOE.

couple of plow shoes are shown in the illustration. One is made of a piece of oak or other hard wood plank, 16 or 18 inches long and a foot wide, narrowed and beveled at the front, and provided with

two staples or rings. A leather strap or a piece of rope is tied from one ring to the other, and the point of the plow share put under it. The plow share then rides upon the shoe and slides along the ground with ease. Another kind of shoe may be made from a piece of a split log, pointed at one end, and notched as shown in the illustration, so that the point of the plow share will catch in the notch and hold the plow to the shoe as it is drawn along. The flat shoe is the more desirable one, because when the plow is brought in to the tool-shed, it may stand on the shoe and be kept from the ground, preserving it from rust, besides it is always ready for removal.

A Useful Clamp.

The clamps in general use by mechanics, and which are tightened by screws, are slow in operation, and are very much in the way in some kinds of work. A form of clamp that is unobjectionable in this latter respect, and that is instantaneous in operation, is here illustrated. It may be made of cast or wrought iron. In the former case, any mechanic who wishes to possess them, may readily cut the patterns out of wood, and have as many as he wants very cheaply cast of the size he needs at a foundry. It is in shape similar to an elongated horse shoe, with a flattened face inside, spread out at the edges, and tapering in thickness to the points. A ridge or flange at the back of each arm, gives strength and rigidity. The arms are not parallel, but one diverges somewhat from the other. A slide tapering from end to end, in exactly the same proportion that the one arm diverges from the other, fits upon the diverging arm. Its face is made parallel to the opposite arm, but as it is moved upon the diverging arm, it recedes from or approaches the other one. Thus by driving it down, it is made to clamp instantly anything placed between the arms, and when it is driven up, it releases it at once. The illustration shows the clamp complete; at *a* it is shown in section in such a manner, that the mode in which the slide fits upon the arm is seen. This slide may be made with a projecting heel, as seen at *b*, in which case a blow upon the curved part of the clamp will tighten it upon the work held by it. The contrivance will be found useful in blacksmiths and carpenters' shops, as well as in the farm work-shop.

CLAMP.

Sawing Wood by Horse-Power.

The accompanying illustrations of a machine for sawing wood by horse-power, have been prepared in accordance with the requests of several correspondents. Figure 1 represents a table upon which the wood is placed on a sliding carriage, and pushed up to the saw. Figure 2 is another device, in which the wood is placed upon a hanging carriage, and is allowed to be pressed against the saw almost wholly by its own weight. The last named we have found to be preferable, as it works with greater ease, and is safer from accident. The tables are stoutly built of 4 x 4 oak or maple scantling, morticed together, with tops of one inch oak boards, closely jointed. There are two shafts, one upon the lower part of the table carrying an 8-inch pulley upon which the belt from the horse-power runs, and a second pulley 22 inches in diameter, made to act also as a heavy balance wheel, from which a belt is run on to the saw pulley, 6 inches in diameter, upon the second shaft, which is just below the top of the table. The saw is 28 or 30 inches in diameter. This latter shaft should run in thimble boxes, and should be as short as possible, 12 inches being a sufficient length; it will then run steadily without any side motion. So far the construction of both tables is alike. That shown at figure 1 has a sliding carriage, which runs upon grooved rollers traveling on hard wood rails, and is drawn backwards by a cord attached to a hickory spring, upon the lower part of the frame, or to a weight which hangs near the corner post. The carriage runs only upon one side of the saw, and the wood is laid upon it with so much projecting as it is desired to cut off at one stroke. The saw is so much exposed that if the operator is at all thoughtless or careless, he may lose a finger or two before he knows it, and it is therefore objectionable for any but a skilled mechanic. Its chief advantage is that by removing the carriage and putting another saw upon the arbor, boards may be ripped, and other similar work may be done. The frame shown in figure 2 is perfectly safe if used with ordinary care, or without recklessness. It is shown in detail at fig. 3. It is hung upon an iron rod which passes through iron or wooden boxes or sockets upon the top of the posts. These posts are made to lean forward, so as to throw the frame sufficiently from the edge of the saw when the wood is laid upon it, that the saw may not be struck suddenly. A catch may be placed upon the left hand post to keep the frame from swinging against the saw until the operator is ready; when the catch will be pushed back with the left hand while holding the wood with the right, so as to allow it to come into easy contact with the saw. A very gentle pressure is all that is required to carry the frame past the saw, and to cut the wood. The severed portions are thrown off with the right hand, while the left conducts the frame into its forward position again. Then the wood is shifted along the frame by the mark of a guage upon it, and the operation is repeated. With an elevation of 3½ inches to a foot, of a one horse tread-power, or a two-horse-power with one horse, and pullies and saws of the sizes here mentioned, one cord of wood not over 8 inches thick, can be cut "once in two" in an hour; or half a cord can be cut "twice in two," in the same time. It may here be mentioned that by splitting wood fine before it is sawed, a great saving of time is effected, not only in the sawing, but in the splitting; for it is easier to split one piece four feet long, than two pieces two feet long, or three pieces sixteen inches long, and the amount of handling after splitting, is less in the first case than in the other cases. The sawing is also more rapid, inasmuch as the accumulated force or velocity of the saw and machinery, is exhausted before a thick stick is sawn through, and the motion becomes very slow, often obliging the operator to withdraw the wood until the speed is recovered, which never happens in sawing wood that has been split thin. This is not generally known, or if known is usually neglected. Proper lubricating of the bearings and boxes is very important. For the boxes, sperm or the best lard oil only should be used, and tallow for the thimble boxes. A sharp saw is also an absolute necessity for easy and rapid work, and the frequent moderate use of the file is advisable, rather than an occasional thorough filing, which uses up a saw as fast as many moderate filings. This rule will apply to many other sorts of tools and cutting machines as well as saws.

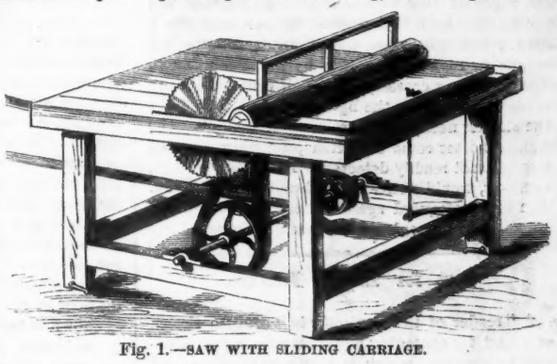


Fig. 1.—SAW WITH SLIDING CARRIAGE.

Fig. 2.—SAW WITH HANGING CARRIAGE.

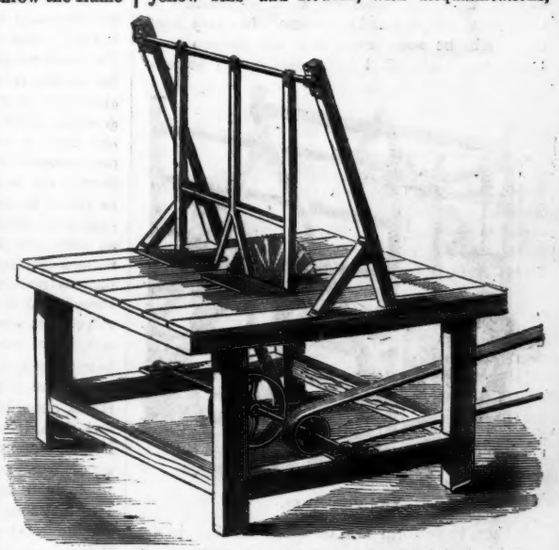


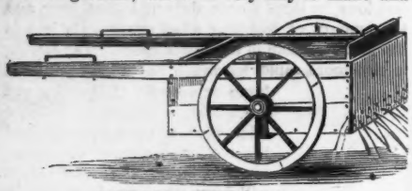
Fig. 3.—HANGING CARRIAGE—FRONT VIEW.

COUNTERFEIT PEKIN DUCKS.—Almost every thing is counterfeited, as well as greenbacks, and eagles — even ducks, much humbler birds, come in for their share of misrepresentation. Aylesburys, with yellow bills and Rouens, with disqualifications, are put off upon the unsuspecting, as purely bred birds. The Pekins, though but just introduced, are already crossed with other varieties, and

dishonest men are strongly tempted to sell them as purely bred birds. The Pekin drake is so strong and vigorous that he marks all his offspring, and the crosses with Aylesburys, Rouens, and Black Java, which have come under our observation, are invariably increased in size by the Pekin blood. The Aylesbury crosses, though all white, are readily distinguished by the lighter color of their bills, the smaller neck, and narrower build behind. The Rouen crosses come out often pure white, and the fraud is not readily detected. The practiced eye, however, would notice the different shape behind. The true safeguard against these and all similar frauds is to buy only of responsible parties.

Cart for Liquid Manure.

A "reader of the *Agriculturist*" sends a sketch of a cart for spreading liquid manure upon meadows or gardens, which is very easy to make and

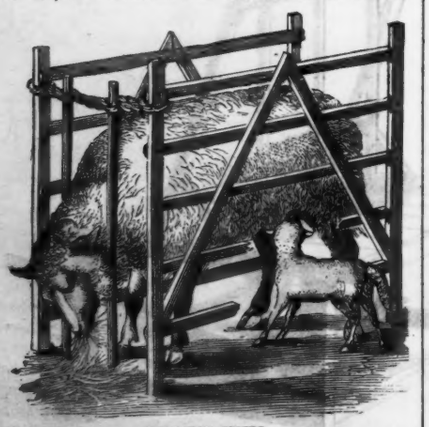


CART FOR LIQUID MANURE.

handy to use. It is a box made similar to a common box cart, but water tight, and with two tail-boards. The tail-boards work in tight fitting grooves, with not over one inch between them. The outer tail-board has several small holes bored in it, as shown in the engraving, through which the liquid manure escapes when the inner tail-board is raised. The cart is hung upon a bent iron axle, so as to bring it near the ground. The cart body is rendered water-tight by making the joints with tongue-and-grooved boards, and fitting them together with tar or oil paint. After giving the interior a thorough coat of tar, a second bottom of thin boards is put down with screws or wrought nails, while the tar is soft. This cart may be used for many purposes about the farm, such as gathering roots, moving manure, and similar services.

Care of Lambs.

The usually gentle sheep can be remarkably ill-natured and obstinate when it chooses so to be. These peculiarities often lead to an unmotherly conduct towards their lambs, many of which would be lost were not these untoward propensities in their dams watched and overcome. In every flock there will be some ewes that will disown their lambs, and resist all but forcible means to com-

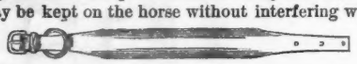


PEN FOR EWES.

pel them to perform the necessary nursing to the helpless creatures. In such cases various expedients are adopted to overcome their dislike. Small, close darkened pens or stalls, in which the ewe and the lamb alone may be confined together, will be found effective in bringing the mother to own her lamb. The ewe in such a pen, can not escape from the lamb, and if she is held twice a day to allow the lamb to suck, it will manage to procure enough at other times to keep it thriving. After a few days' confinement, the ewe's dislike usually wears off. When she is more than usually vicious, and attacks the lamb with head and feet, a common practice amongst careful shepherds, is to put the ewe in stanchions in the pen. These are made by driving two stakes into the ground so close together that the ewe's head can not slip from between them, and after pressing them apart, and securing her neck between them, they are tied together by a hay-band or a piece of cord; thus confined she can reach her feed placed before her, but can not turn to attack the lamb. The pens may be made of hurdles driven into the ground, or the floor of the sheep shed, about two feet apart, as shown in the illustration; a portion of one hurdle is broken away to show the lamb. The lamb can creep under the bars and find room enough to get about. If the ewe lies down rather than let the lamb suck, as some obstinate ones will do, a bar of wood may be put under her belly from one hurdle to another, and resting on the bars, so that she can not lie down until it is removed. It is needful for the shepherd to visit the ewes two or three times a day and see that the lambs get all the milk the mothers may have. With the help of these contrivances, perseverance and gentleness will bring the ewes to their duty in a short time.

A Hitching-Strap for a Horse.

The most secure method of hitching a horse is by a halter and neck-strap. A horse thus fastened can do no injury by flying back, as some will habitually do. The strap and halter is easily carried, or it may be kept on the horse without interfering with

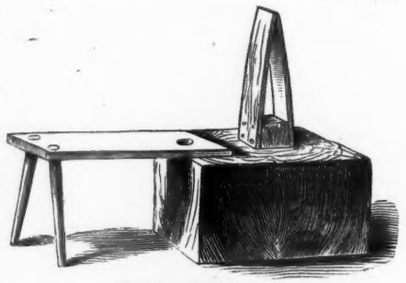


HITCHING STRAP.

the harness, and is as easily and quickly hitched in this way as in any other that is not so safe. The strap is 32 inches long. The flat part is 8 inches in length; the center, which is rounded or not, as may be desired, is 18 inches, and the end to which the buckle is affixed, is 6 inches long. A ring is secured to the strap about 2 inches behind the loop of the buckle. The form of the strap will be seen in the illustration. It is made of strong harness leather.

Mending Harness.

"A stitch in time" in the harness, at this season, will probably save considerably more than the proverbial "nine" when the busy season commences. To mend harness, the first thing needed is a clamp for holding it. A very good clamp may be made of a stave of a flour barrel cut in two in the middle. A small block with two sides beveled is fixed on the top of the larger block, and the staves are screwed firmly to it, as in the engraving. Screws are to be preferred to nails, which would be liable to split the staves. The upper end of each stave is smoothed and beveled so as to take an even and firm hold of the leather when it is slipped between them. Fine copper wire is a better material with which to mend harness than thread, and is much more convenient in use. A roll of this wire should be kept on hand. Rivets and burrs should be used for splicing traces or heavy parts of the harness. A few of these, with a punch and a light tack hammer for clenching the rivets, should form part of the tools, and a straight awl should be procured for making holes in the leather when the original holes have become filled up or worn so as to be useless. A seat may be made by fixing two legs to a piece of board about two feet long; the other end will then rest upon the block when it is in use. When not in use it may be hung up on the wall of the tool-house by a hole in the end. Such a harness-mending apparatus, in lack of a more costly "kit" of tools ought to be kept in every farm workshop. A strap may be mended in two or three minutes for one cent, that would cost ten cents at the harness makers, and the loss of time; and thus in one



CLAMP FOR HARNESS.

year a man might save the whole cost of a volume of the *American Agriculturist* in this way alone.

Cisterns—Lessons of the Drouth.

We heard great complaint of scarcity of water in many parts of the country during the winter. We did not have the usual fall rains, and the ground froze to an unusual depth, so that the winter rains remained upon the surface in the shape of ice, or ran off into the streams. Some springs gave out, and the streams in some instances froze to the bottom. Pipes that had escaped injury for twenty years, were frozen solid, and many farmers have had to carry water long distances for household use, and for stock. The inconvenience and expense will not be wholly lost if it leads farmers to provide cisterns near the house or barn, in which a large supply of water may be stored for just such emergencies. Stone, lime, and cement, are cheap in most parts of the country, and with these, any man of average skill can make a cistern that will store all the water needed—generally the rain water from the roof of barns, if saved, will supply all the stock kept upon the farm. In many cases, the cistern is most conveniently located in the bank, immediately back of the wall to the barn cellar, and the water can be drawn through a faucet at the bottom into the trough for the cattle. In other cases, the cistern could be made in the yard, and the water be drawn by an endless chain or pump. Those who have suffered inconvenience through the past winter, are just at this time in a good frame of mind to consider the advantages of a cistern. There is money in it for the purse, and a great deal of comfort for both man and beast.

Pens for Calves.

There is nothing in which we are so generally deficient in our farm arrangements, as in the treatment of our young stock. This neglect is most frequent and conspicuous in the case of calves. Just now, when the warmth of the spring sun adds to the

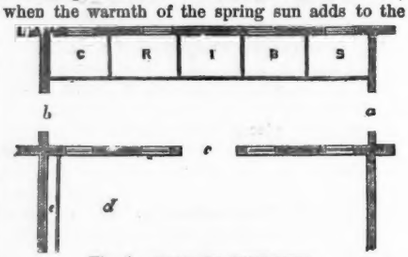


Fig. 1.—PLAN OF CALF-SHED.

distressed appearance of last year's calves, that have been wintered in a cold shed, or in a partly sheltered yard, their poor condition is made relatively worse by the sleeker state of the cows, which have had all the good treatment that could be afforded them. Nevertheless these young animals are those by which the dairy is by and by to be replenished. It is a mistaken idea, although it is a common one, that exposure to cold hardens the constitution of a young animal, and that by half starving a calf, the tendency to take on flesh and fat, so much dreaded, or pretended to be dreaded,

by some dairymen, as antagonistic to good milking qualities, is prevented, and good dairy cows are thus made. The production of milk is a heavy drain upon the system of the cow, and a sound constitution, perfect digestion, and vigorous health are needed to sustain it. Exposure and spare feeding of a cow do not tend towards these conditions. Amongst the progenitors of the present highly valued "Duchesses," were remarkably prolific dairy cows, and the heavy milking Short-horns, were, and are so made by the very best of feed and care. It will pay to treat a native calf well, as it will pay to treat well a pure blooded calf of any of the choice breeds, and as the native stock greatly outnumbers the pure bred stock, it is very important that they should receive equally good care as the more costly and fortunate animals. Few farms have a well appointed calf-house, but we know from experience, that nothing upon the farm pays a better profit on its cost, than such a house. Its cost need be but very trifling. A good, comfortable house to accommodate 20 calves, may be put up for $100 and upwards, according to its style or finish. The cheapest, if it is only substantial, is as useful as the most costly. The object sought is profit, and therefore no unnecessary outlay need be made. It

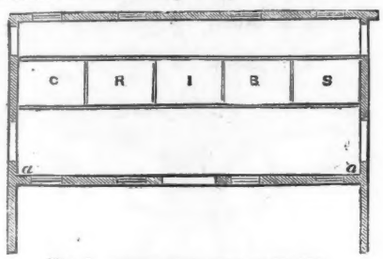


Fig. 2.—SHED WITH TWO PASSAGES.

is best to have the house divided into separate pens or cribs, the least size of which should be 30 square feet, for each calf. Double pens to hold two calves, are objectionable for several reasons. Herewith we give plans of some excellent calf pens, which we find in an English journal, "The Country," and which are designed by a well known agricultural architect. These houses are divided into small enclosures or cribs, of the size before mentioned. In the plan seen at fig. 1, these are arranged against the wall, and are well lighted by windows. In front of the cribs is a broad passage, into which the doors of the cribs open. Doors, at *a* and *b*, open from this passage outside of the building, (also seen at fig. 4), and at *c*, into the yard *d*, where the calves may be turned out for exercise. In the yard there is a feed trough, at *e*. Four windows in the wall between the passage and the yard, give ample light. It is important for the health of young stock, that there should be plenty of light and fresh air in the pens provided for them, and in the plans these requisites are amply supplied. In fig. 2 a passage is provided in front of the cribs, for the purposes of feeding only, and that in the rear

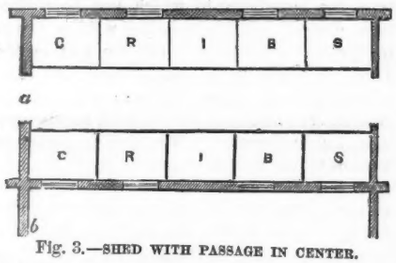


Fig. 3.—SHED WITH PASSAGE IN CENTER.

is used only for cleaning the cribs and moving the calves. In other respects the plan is similar to that shown in fig. 1. In fig. 3 the cribs are arranged on each side of the passage, and the yard is reached through the door, *a*. Figure 4 is an end elevation of the building, showing the outer door, *a*, the drains in the floors of the cribs, *b*, and the partitions between the cribs, *c*, *d*. The floors of the cribs, as well as of the passages, should be of cement. The former are intended to slope from each side of each crib to the center, where there is a small grated drain, by which the liquid waste is carried off. The partitions are made of lath, so as to offer no impediment to perfect ventilation. The

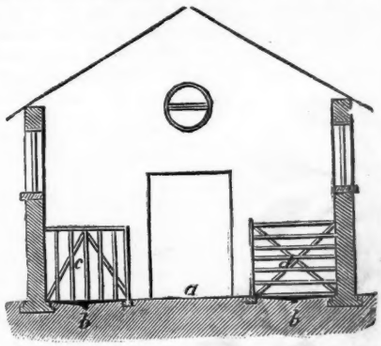


Fig. 4.—END-SECTION OF CALF-SHED.

cribs may be provided with feed and drinking troughs, or pails may be used. The latter are preferable, especially when the calves are young and are fed upon sweet milk, but it is always advisable to have the feeding utensils sweet and clean. Calves are very sensitive to the evil influences of food that has been allowed to ferment and sour, and though they may thrive upon sour milk, yet a high degree of acidity is almost certain to produce diarrhœa and sickness. A small box in which a quantity of powdered chalk is kept, which they may lick occasionally, would be a useful addition to the furniture of the cribs. The front of the cribs is also of open work, similar to that of the sides. The hinges of the doors of the cribs are of wood. The doors are barred the same as the front and sides. The upper and lower bars of the doors are extended, as are also the bars in the fronts, which meet the extended bars of the doors. Holes are bored through these extended bars, and pins of hard wood are inserted. The doors, when opened and closed, are made to swing upon these pins.

Sheep-Raising in Virginia.

Having read the articles in the *Agriculturist* of November and February last upon "Sheep-raising in Virginia," I ask you to allow me to come to the rescue of Orange Co., as I think that your associate must have gathered his information on the subject at as long a distance from Orange C. H. as he did from Alexandria. I have been in the market for sheep since we came here in 1871, and up to this time have not been able to buy any healthy sheep for less than $3 per head. We have a flock of over 300, and should be very glad to add to that number at $3 per head for fair stock. Our land is well adapted to sheep-raising, and our short winters enable us to send our early lambs to market at least three weeks ahead of New York state. The majority of our farmers let their sheep run out all winter, and of course have to furnish "rations" occasionally for some hungry dogs, but as I have profited by the advice given in your valuable paper, and have my flock under lock and key every night, the result is that I have not lost one by dogs. Our enclosure is 100 feet square, with posts ten feet high. We have 12 feet in width on three sides covered in with a pointed roof, making a covered enclosure 12 by 300 feet with a good loft overhead for fodder. The front side is a fence 10 feet high with double doors in the center, making the enclosed yard 76 by 88 feet, which we divide off by movable hurdle fences as required, giving sufficient room for feeding purposes in each division, and all accessible with double teams to supply fodder or remove manure, and this makes us secure from dogs, thieves and storms.

In regard to our farms, I am satisfied that the land is as easily improved as the average of farms in New York state or New Jersey, and that our crops will compare favorably with those under the same treatment. In walking over our farm recently with a friend from New York state, I pointed to the poorest portion of our farm, and asked him what that field of about 100 acres would be worth for farming purposes if located in New York, say 300 miles from the city, the land to be of the same quality and in the same condition, and he replied not less than $75 per acre. I then asked him why it was not worth as much for farming purposes here as in New York state. Our winters are about a month shorter at each end. Our farms are much better watered. Our labor about one-half the price, and as good as foreign labor, and our markets equally as good and as accessible. The result of my experience confirms me in the opinion that four years since induced me to move here from New York: "That no state, north or west, holds out more inducements for farmers with sufficient capital to purchase stock and work their farms than Virginia." Our farms are too large; my next door neighbor has over 3,000 acres. Our farm is but about 2,000. We use steam power for threshing grain, shelling corn, grinding flour and meal, cutting fodder and sawing our lumber and firewood, and with such large farms it pays to do so. If your associate will give us a call on his next "tour of observation" through our State, I think that I can show him a sufficient number of good farms in this vicinity to induce him to carry home a more favorable report than his last. N. B. Our farm is not for sale. H.

ORANGE C. H., VA.

A Way of Breaking Colts.

In the *Agriculturist* of September, 1873, we illustrated and described a method of breaking colts to harness, which, however, was incomplete, in that the driver, having no way of riding, had to walk behind the colt. A better method is here illustrated, by which the driver may ride, and have the colt completely under control. The rig is made of two long, light, but strong hickory poles, bolted to the axle of a light wagon or sulky. These are fastened together by light tough hickory saplings, "whipped" to them by stout cord, wire, or hoop-iron in three or four places. A foot board is fastened to them, and a light seat. The poles project in the rear beyond the wheels several feet, and at the end of each there is fastened a bent sapling, in the shape of an ox-bow. These reach to within a few inches of the ground. Their purpose is to prevent the colt from rearing if he feels so disposed, and they do this very effectively by striking the ground, and throwing the whole weight of the "rig" and the driver upon him whenever he makes the attempt. The breaking sulky, as it may be properly called, is seen at fig. 1. In the engraving given on the following page is seen a method of preventing the colt from kicking. It consists of two ropes which are fastened to the check rein, and passing through loops or rings stitched to the back straps, are fastened to the shafts. If the colt attempts to kick, his head is thrown up, and as the two things can not be done

Fig. 1.—BREAKING SULKY FOR COLTS.

at the same time, he is simply prevented from kicking. However fractious a colt may be, he can do no harm in this rig, either to himself or the driver, and if patience and good temper are preserved and exercised, the colt will come to his work as soon as he finds what he has to do. The breaking should be done on a good, smooth, level road or track, and without any noise or hurry, keeping the animal easy, in good temper, and not tiring or worrying him. If the colt has been well treated and handled up to this time, he will probably go right off without any trouble or hesitation in this sulky, and if he does not at first, if he is given time, he will soon find out that he can do no mischief, and will not be likely to persevere in his attempts to do it, if treated as here indicated.

Tuberous-Rooted Begonias.

It is not our custom to highly commend a plant unless we have had some personal experience with it, but sometimes, in regard to recently introduced novelties, we are obliged to rely upon the representations of others; in such cases we distinctly give the sources of our information, which are usually European, and the reader can decide whether the plants appear to be worthy of trial. Not long ago Messrs. B. K. Bliss & Sons handed us some tubers, which we could not recognize as any that we had ever seen before, and we were quite delighted to learn that they were the tubers of some of the new Hybrid Begonias, about which so much has been said in the European journals. Several years ago there were introduced from South America a number of species of Begonia, quite different from those heretofore cultivated in greenhouses; they have tuberous roots, and annual stems which die down after the flowering season is over, and the tubers have a season of rest. The foliage presents a variety of form and color, and the flowers, which are produced in great profusion, are distinguished by their great size, and often elongated bell-shape,

TUBEROUS-ROOTED BEGONIA.

often with a marked difference between the male and female flowers in size, shape, and duration. The most conspicuous of these species are *Begonia Boliviensis*, with bright red flowers, *B. Veitchii*, vivid vermillion color, *B. Pearcei*, bright yellow, and *B. octopetala*, with large white flowers. *Begonia Veitchii* was found on the Andes, at an elevation of over 12,000 feet above the sea, and with some others has proved entirely hardy in Europe. Several florists in England and upon the Continent have hybridized these species, and again crossed the hybrids, and have thus produced a great number of forms, of which the European catalogues offer some fifty named hybrids, presenting a great variety of colors, such as orange, salmon, scarlet, blush, rose, pink, and crimson, with numerous intermediate shades, and they promise to become exceedingly popular plants, both for the summer decoration of greenhouses, and for the open border. The ordinary greenhouse Begonias are divided into those grown for the great beauty of their leaves, such as *B. Rex*, and its allies, and those cultivated for their flowers, of which *B. fuchsioides* is an example. These newer kinds have been variously called Flowering Begonias, Handsome-flowered Begonias, and New Hybrid Begonias; Tuberous-rooted seems to be the most descriptive name, as it includes the original species, and the hybrids which have been derived from them. Besides the bulbs, which are as yet quite scarce, seeds are offered for sale, from which it is likely that entirely new forms will be produced. Not having raised these from seeds, we can only repeat the directions given in the European journals, to sow very thinly in a pot of rather sandy soil, and cover very lightly; when the plants are large enough to handle, they are potted off singly into pots of light, rich soil. Those which flower in pots have the stems cut away when the foliage begins to fail, and the pots turned on their sides to keep the tubers dry until spring. The tubers of those flowering in the open ground, should be lifted at the end of the season, and preserved in dry sand or dry moss. Having seen some of the species from which these varieties are derived, we are prepared to see some of the hybrids sustain the claims made for them abroad. Mr. Bliss, who saw them in Europe, thinks they are destined to make a sensation among the lovers of flowers in this country, as we may hope they will be more brilliant in our climate than in that of Europe. It will be necessary for the bulbs to be more abundant than they are at present, before we can venture to test their hardiness, which in the northern states, at least, can hardly be hoped for. In August last one of these hybrids in the grounds of Messrs. Veitch & Son, (Eng.), which had been out for the three previous winters, formed a dense mass two feet high and three feet across. The engraving gives an idea of the habit of these Begonias; this one has bell-shaped flowers; in others the flowers are cup-shaped and larger in proportion than these.

A SULKY FOR COLTS,-SHOWING ANTI-KICKING ARRANGEMENT.—(*See preceding page.*)

The "California Nutmeg"—Torreya.

After the wonderful discoveries of gold in California, people were ready to believe anything that might be told of that country, and

A CHARLESTON SOUP-BUNCH.—(*See page* 186.)

stories of mines of soap, cinnamon trees, and trees loaded with nutmegs, found ready credence. Indeed it was insisted that the genuine East India nutmeg grew there, and the production of this spice was looked upon as one of the future resources of the country. Happening to be in California at the time the nutmeg was much talked of, and but little known, we came in contact with the indefatigable collector, Mr. Lobb, who had just succeeded in finding the trees, and in gathering some of the fruit, the knowledge of which had heretofore been derived entirely from the wild stories of prospectors and miners. The fun had by Mr. Lobb, the lamented Dr. Randall, and the writer, in testing this wonderful nutmeg, will long be remembered as among the pleasant incidents of botanical exploration. We tried very hard, in various ways, to make it taste or smell like nutmeg, but there was an uncompromising flavor of turpentine, that the most prejudiced could not ignore; we never tried the nutmegs said to have been made in Connecticut, but if, as alleged, the best makers used sassafras wood, we have no doubt as a spice they would be far preferable to the California product. The "nutmegs" collected by Mr. Lobb, went to England, and the tree was described by Sir Wm. Hooker as *Torreya Myristica*, but before that publication appeared, a Mr. Shelton had taken specimens to Doct. Torrey, who recognized them as belonging to a genus named after him many years before, and he described

the tree as *Torreya Californica*, a name which having priority of publication, though European writers do not seem to be aware of it, must take precedence of that of Hooker, who in giving the specific name, recognized the name of nutmeg (*Myristica*) given it by the Californians. We were led to notice this tree, from the fact that it last year fruited in France, in the celebrated nurseries of Thibaut & Keteleer, and a fruiting branch of the natural size was given in a recent Revue Horticole, whose engraving is here reproduced.

"CALIFORNIA NUTMEG."—(*Torreya Californica.*)

The genus *Torreya* was established nearly 40 years ago by Arnott, from specimens of a fine tree in Florida, which he called *T. taxifolia*; it belongs to the sub-family of the yews, but as compared with the true yew, the pulpy envelop surrounding the seed is exceedingly thin. It is hardly necessary to say that the genus was named in honor of the late Doct. John Torrey, a name held in loving reverence by every American botanist and lover of native plants. Since the Florida species was made known, at least three others have been described: *T. nucifera*, of Japan, *T. grandis*, of northern China, and *T. Californica*, of our own Pacific coast; there is possibly another in the Bogotan Andes, but this is not well established, but without this all Americans should be glad that the genus bearing this precious name should have so wide a range. In Europe the *Torreyas* are highly valued in cultivation, but they can hardly be said to have had a fair trial with us, as is often the case the Florida species is much more readily procured abroad than in this country, and this is hardy in a more severe climate than that of New York City. There is now on Central Park a tree of this species which is interesting, and may be regarded as historical in its associations; it (or the seed) was brought from Florida, by the late distinguished Maj. Le Conte, and was cultivated for many years by New York's earliest florist, the late James Hogg, (father of the present editor of the American Garden), and was at length removed to Central Park, where we hope it may long survive. Though this is a native tree, it is more difficult to procure than one from the Himalayas; wishing a specimen, to replace a lost one, we were obliged to send to Europe for it. Of the two Asiatic species we can say but little; of the Californian *Torreya* we had a small specimen, but in the winter of a few years ago, when native red-cedars and such trees, were killed in the spot where they had stood for 50 years, this went to the brush heap with many other treasures. In California it makes a large tree, according to that State's most indefatigable explorer, Dr. Kellogg, it grows in the Sierras at least 100 feet high, and with a diameter of 15 inches, furnishing wood of great hardness and durability. The tree which fruited in France, was about 15 years old, and to translate from M. Carriére's article, it "is one of the handsomest trees that one can see, and possesses all the qualities which should make it sought for,"—"it is nearly 6 meters (about 20 ft.) high, and the stem is furnished from the base to the summit, the branches so near together and covered with leaves, that it forms a compact mass of green with a very fine effect." It is hoped that experiments may show that this fine evergreen will be hardy with us; at all events should it get fairly into commerce, and not be hardy at the north, it can be enjoyed by our friends in the southern states.

A Double Bedding Lobelia.

When Mr. H. E. Chitty, of the Bellevue Nursery, Paterson, N. J., returned from Europe last summer, and told us that he had brought over, among other varieties, a double blue

NEW DOUBLE DWARF LOBELIA.

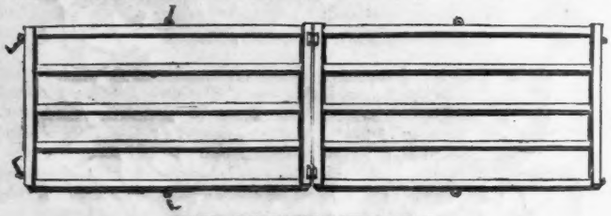
lobelia, we were disposed to pooh-pooh at it. Doubling is all well enough with some flowers, but others are better single, and among these we thought were the lobelias. "Wait until you see it," was his reply. He remembered that there was but one way of convincing us, and in due time there came a couple of plants, which have been in the greenhouse all winter, and—well, we give it up. This double lobelia is better than a single one. This variety originated as a chance seedling in the nurseries of Messrs. Dixon & Co., Hackney, London, in 1872, and was first exhibited at the exhibition of the Royal Hort. Society early in 1873, where it received a first class certificate. It is given in the catalogues as *Lobelia pumila flore-pleno*, which will do well enough for a name until we have a better; a dwarf strain of the old *Lobelia Erinus*, has been called *pumila*, and this plant looks as if it might belong to that. Its habit is even more dense and branching than the well known sort; it has a great disposition to spread side-wise, and but little to run up, at least while under glass; its flowers, which are abundantly produced, are handsomely double, and remind one at once of miniature double Larkspurs, of a dark blue, inclining a little to violet. While we are much pleased with what we have seen of this plant, it is but fair to say that in England opinions differ very widely as to its merits; while some of the writers for the journals state that it has been a sore disappointment, and even a fail-

ure, others are equally positive in its praise. On the continent it seems to have made a better record, and the journals speak highly of it. How it will behave in the open ground here, remains to be seen; if it only does as well as the single *Lobelia Erinus* and its varieties, we shall have no reason to complain; the original species being from the Cape of Good Hope, we shall expect this to be more at home under our bright suns, than in the duller climate of England. At any rate, if it does not serve us well in the border, there is no doubt that as a pot plant, and for vases and baskets also, it will prove one of the best of recent introductions. We thank Mr. Chitty for convincing us that a lobelia can be both double and handsome.

Straw Mats—Quickly Made.

BY H. SACKERSDORFF, BERGEN CO., N. J.

The article in the April *Amer. Agriculturist*, on the Lancashire mats, or screens, induced me to try to make the ordinary mats by this method. As the mats needed for covering hot-beds, cold-frames, etc., are required to be of a different size from the Lancashire screens, as well as of less thickness and weight, a different frame was necessary. To make



FRAME FOR MAKING STRAW MATS.

this I procured ten strips each 7½ feet long, 2 inches wide, 1 inch thick, and four pieces of the same material 4½ feet long, for cross pieces. Each end of the long strips was "halved," for half its thickness. Two of the cross-pieces being laid down, five of the long strips were placed, one in the middle, one for each side, and the other two equidistant from the center and side strips, as in the diagram, and firmly nailed, this made one-half of the frame; the other half was made in the same way, and the two hinged together at one end as in the drawing. The space between the long slats when the two parts are shut together, is one inch. To keep the frame from springing apart, after being filled with straw, a hook and screw-ring was fastened on each side at the center, and two on the end. The frame was now finished, and after laying it upon a pair of horses, it was filled with straw laid crosswise and evenly, with the but-ends projecting beyond the frame an inch on each side. The halves, being fastened by means of the hooks, it is set on end and kept in an upright position by any convenient support, and is ready to be sewed. The needles used are about five inches long, and half an inch thick, and can be made of any light wood, as the mats, being only an inch thick, do not require such strong needles as those described in April. The sewing is done in four places, the stitch being the same as described for the Lancashire mats, with the addition of tying each stitch, making a simple tie each time the thread is put through. This tied stitch is very secure, and prevents any slipping of the twine. This differs from the other mats, you will observe, in having the straw laid crosswise and the sewing done lengthwise, as shown in the illustration by the dotted lines. After the sewing is finished, the projecting ends of the straw are cut off even with the frame; which may be readily done with a strong, sharp knife. For hot-beds the mats are made 7 feet long, in order that there may be 8 inches to hang over at each end; the frames are made 6 inches longer, as so much is lost in the length by the taking up in sewing. Their width, 4½ feet, allows two mats to cover three 3-feet sashes. These mats are light, flexible, and strong, and can be made about twice as quickly as by the old style of weaving them. Two men with a little practice can readily make ten mats in a day, while, according to Mr. Peter Henderson, two men, by the old plan, can only turn out five mats a day.

[The foregoing comes from a friend whose gardening operations we have frequent occasion to observe; we have examined his mats, and are sure that for excellence and apparent durability, they are superior to any we ever made in the old way ourselves, or have seen made by others. To any market gardener who uses many mats, (and some have hundreds of them,) this one hint as to the saving of time is worth in money value the cost of the *Agriculturist* for the rest of his life.—ED.]

What is a Soup-Bunch?

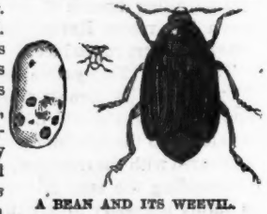
A gardener who sends his "truck" to Chicago, writes that he sees "soup-bunches" quoted at a good price in the market reports, and writes to know what they are, and what he shall grow to make them. A soup-bunch is variable as to quantity and quality. It is essentially celery tops, parsley, leeks and thyme; sometimes other herbs are added, but so far as we have noticed those sent to the New York market, there are rarely any other than these in the bunch. The relative portion of the contents varies with the season. In fall when celery is being taken up, the refuse heads, too small to store away for winter, are put in, later the outer leaves that are trimmed off in bunching are used. In summer the leaves of celery that has been grown for the purpose, are put in. To grow celery expressly for this, some tall kind is sown, and it is grown without earthing up, the object being the green leaves only. As to quantity, we can give no rule. The size of the bunch depends upon the season, but at best it can only be described as a handful. The customs in the Chicago market may be different from those of New York, and it will be well for our gardening correspondent to make special inquiry as to this, as such are the prejudices of people in these matters, that an article too much in his soup-bunches would be quite as likely to spoil their sale as one too few. In visiting a strange place, we always make it a point to examine the market, and learn upon what the people live. Cities so near together, and between which there is such constant intercourse as Boston, New York, and Philadelphia, offer marked contrasts in their market customs, while the differences between those of these cities and New Orleans on the one hand, and Montreal on the other, are curious and interesting. A few years ago we saw in the Charleston, S. C., market, soup-bunches that far eclipsed anything we had before seen. The truck stalls were kept by middle-aged negro women, who, as to age, size, weight, and volubility in importuning persons to purchase, might have been the same that we saw there 25 years ago. These old negroes put up their soup materials with an eye to the tasteful that would quite put to shame the slovenly huddles of the New York markets, and deserved to be called "soup bouquets" rather than "soup-bunches." We make a sketch of one of these from memory, which is given on page 184. The basis, or frame-work was a cluster of celery-leaves, conspicuous at each side of this were crescents cut from some kind of a squash or pumpkin; onions, small turnips, and carrots, were then tastefully worked in, while sprigs of slender sweet-herbs, imparted to the whole a finish that one would think hardly possible with materials so devoid of beauty as pot-herbs. It will be seen from this that in so insignificant a matter as a soup-bunch, the markets of different cities demand not only different materials but different styles of preparing them, and whoever is to supply any market with any produce must first learn its ways. In the New York market the bunches are sold from the wagons, and are not handled by the commission men.

Bean and Pea Weevils.

The common pea-weevil (*Bruchus pisi*) is unfortunately too well known all over the country, though with regard to this, as well as many other common insects, there is a great want of popular knowledge as to its habits, many thinking that it is only found in those peas which have not been properly kept after harvesting them. The eggs are laid by the mother beetle, upon the very young pods as soon as they begin to form, the work being probably done in the night; they are very minute, and of a deep yellow color. The newly hatched grub or larva, yellow with a black head, makes its way through the pod, and into the nearest young pea, one grub only to each; the hole it makes in the pod soon grows over, but on the surface of the pea a minute discolored spot may be observed. Once within the pea, the grub "grows with its growth," usually avoiding the plumule or growing point of the seed; by the time the pea has become ripe, the grub has completed its growth, and is ready to go into the chrysalis or pupa state, but before doing this it has the instinct to provide for its future exit, by making a circular hole to the surface of the pea, but without cutting through the seed-coat or hull of the seed; the presence of the weevil or "bug" in peas, is known by this semi-transparent spot upon the surface, the hole being covered only by the thin parchment-like covering or skin. In some cases the perfect insect or beetle comes out the same fall, but it generally remains dormant until spring. If peas containing these insects are sown, the trouble will be continued, as the weevils will make their way out, and be ready to deposit their eggs at the proper time. When the seed peas have holes in them, the perfect insect has left, or is dead; as such peas will germinate, it is popularly supposed that they are just as good for seed as sound peas; that this is not the case, Mr. Peter Henderson has proved by experiment; the grub of the weevil having devoured a large share of the nutriment intended for the early growth of the young pea, the plants are feeble when they come up, and lacking sufficient food at the start, are never so vigorous and productive as those from the sound seed. Within the past twelve years or so,

A BEAN WEEVIL

has appeared in beans of various kinds, over a wide extent of country; it was first noticed in the New England States, but now extends as far west as Missouri, and we every year receive specimens from widely separated localities. Some supposed it to be the same as the pea weevil, others thought it to be the granary weevil, and entomologists were puzzled over it, and referred it to one or another species of *Bruchus*. At last Prof. C. V. Riley, in one of his admirable reports upon the Insects of Missouri, (1871), described it as distinct from any other species, and called it *Bruchus fabæ*, the American Bean Weevil. For a detailed entomological description of the insect, reference may be made to the above mentioned report. All that farmers and gardeners require to know, is the fact that while really distinct from the pea weevil, its habits are very similar; the eggs are laid upon the young bean-pod, in the same manner as the others are upon the young pea-pod, and it goes through similar transformations. There is one important difference in their habits, while in the pea but one grub grows and develops in each seed, in the bean there are several, as many as 12 or 14 being sometimes found in a single bean, and the whole interior contains nothing but the grubs and their excrement; no matter how many there may be in a bean, each, before it goes into the pupa state, makes a smooth, nicely lined cell. The accompanying engraving from Riley's Third Report, gives a bean with its many spots, a beetle of the natural size, and one much magnified, to show its markings. This weevil



A BEAN AND ITS WEEVIL.

is only about half the size of the more common pea "bug," its general color being a tawny gray.

Of course with both the pea and bean weevil, the only safety is in sowing none but sound seeds, but unless a whole neighborhood will agree to this, however careful one may be, he will be supplied from a less cautious neighbor; scalding will kill the insect without injuring the germination of the seeds, and it is said by White (Gardening for the South) that if seed peas, or beans, when they are gathered, be stored in bottles or jars with a teaspoonful of spirits of turpentine, and kept tightly closed, the vapor of the turpentine will kill the insects without injury to the vitality of the germ.

Little Garden Helps.

Mr. J. H. Spear, Norfolk County, Mass., sends sketches of two appliances that he finds very handy in the garden. One is a simple seed sower, made from an empty fruit or mustard can, shown so plainly in fig. 1, as to need but little explanation. A hole is punched in the bottom of the can, of a size to allow the seed to drop properly, and a handle is fitted to the edge, made of a green stick of convenient length; this is split for about two inches, the edge of the can slid into the split, and two or three large tacks driven through to keep the handle steady, finishes the job. As these are readily made from cans that one is glad to get rid of, several, with holes of different sizes to suit different seeds, may be kept on hand. Mr. S. finds it better to make the hole in the bottom of the can rather small at first, and enlarge it by reaming until just the proper size is hit. In use the drills are first made ready, he then puts a small quantity of seed into the can, and walking at a moderate pace, is able to shake the seed out very evenly. His other device is one for dusting currant bushes with white hellebore, or for distributing any other dry powder that it is desired to apply to other plants. It is a cylinder of perforated tin, 2½ inches in diameter, and 10 inches long; this has a fixed bottom, with a socket (*a*) to receive the end of a handle of convenient length, and a brace to strengthen the socket; the cover, *b*, fits sufficiently close to keep its place while in use. One living at a distance from a tinsmith, could readily contrive a duster from a fruit can; a wooden cover would answer as well as a tin one.

Fig. 1.

Fig. 2.

Budding the Hickory.

"W. F. R.," Mayport, Florida, writes: "In a former number of the *Agriculturist*, I find an article on grafting the hickory, stating that "as far as people in general are concerned, it may be regarded as impracticable."—My experience is as follows: About a year ago I budded a pecan into a vigorous hickory sprout of the same season's growth. The bud remained dormant until the following spring, when the sprout was cut back to the bud. A shoot grew from the bud last summer, which measured nearly ten feet. This shoot has also thrown out seven laterals, measuring from two to four feet each. Last winter I cut down a number of my hickories, some of them measuring nearly a foot through, and this summer have budded the sprouts from them with the pecan. I use *annular* budding, *i. e.*, a ring of bark with a bud upon it, put in place of a similar ring removed from the stock. It is very seldom a bud fails to take, and the few failures I find are occasioned by a small grub, which works between the bud and the stock, which can be prevented by the application of grafting wax,

THE HOUSEHOLD.

☞ (*For other Household Items, see "Basket" pages*).

Home Topics.

BY FAITH ROCHESTER.

All of the time I see a plenty that might be said about various household works and ways, but some topics wait from month to month until more study or observation can be given to them. Then sometimes I find myself, as to-night, too much engrossed with my own cares—planning work for the seamstress who comes to-morrow, wondering if this howling March storm will give way before morning and allow us to undertake the washing already deferred two days, trying to see how it is possible to get ready to remove to other quarters next week, listening to hear whether baby coughs again, and what kind of a cough it is;—too much preyed upon by such cares as these to get fairly started upon any topic of general interest. In order to get myself started, I quote from a recent letter from

A Woman of the "Improving Kind,"

who writes: "You will think I have improved some when I tell you that we have slept with the windows open all winter, and the children have never suffered so little from colds as this winter. We have no stove in the south-east bed-room, and like it better so. As soon as we are out of our beds in the morning, I open them, and open the outside door in my room and the windows, for an hour or so. It is so cold in my room at night that a cup of water will freeze solid, but we all get along with it nicely. None of us have frozen noses yet, which is almost a wonder.

"My husband used to think he could not sleep with a window open in moderate weather without catching cold, but there is no trouble now. I am trying to cook more wholesome food too. I do not make cake at all, and pie only once a week. I hope to learn to make many things both palatable and wholesome. My boarder, instead of being a hindrance to me, is a help in every good word and work. The children have been well all winter, and have improved in disposition since our change of diet."

No Cake.

The "change of diet" referred to in this letter would not be considered very radical by many. All sorts of good food, including meats and fine flour breads, are used, but plainly cooked and eaten with regularity, or only at meal times. The abolition of the "pan of cookies" alone is a great improvement upon the old way of doing. Even plain molasses cookies, used for lunches between meals, work much mischief to the health of the family. All you housekeepers who dare to live without doughnuts, or cookies, or jumbles "on hand," please hold up your hands, and I wish I could count how many there are. Some housekeepers dare not be found without some sort of cake in the house, for fear of unexpected company; some fear their boarders, if so unfortunate as to have them; some their hired help, and some their husbands. These same husbands sometimes inveigh against cake as dyspepsia-breeding, but the wives observe that these lecturers eat no less cake on that account, and they go on trying to please their husbands by cooking those things which the men evidently relish.

I do not feel at all sure that plain cake ought to be entirely abolished from our tables. On this point I would like considerable testimony. I have never made much cake for my family, since it included children, because I found by experience that cake did not agree with them. One of its worst as well as surest results is the destruction of their appetite for simple nutritious fare. The nerves of taste crave something more tickling. I have noticed though, that the more one goes without cake or other food of this kind, the more plainly one can perceive its ill effect when eaten. I used to think this an argument in favor of the free use of cake, and many—perhaps most people—would think so, but I am reminded of a former neighbor of ours, a German, who used to give his four-year-old son a little whiskey every morning in order to accustom him to it, so that he would not be easily upset by its use when older. I have noticed, too, that the more we accustom ourselves to pure air, the more easily we are unfavorably affected by bad air, and the more perceptibly injured by close rooms or a foul atmosphere of any kind. I also see that the more we are accustomed to genuine culture and refinement, the more unpleasantly all narrow-mindedness and coarseness makes itself felt. Also in morals, the pure and honest are pained and sickened by deeds which seem well enough to those habituated to them. In all these things there *may* be some analogy. Anyhow, I have never discovered that our health suffered from lack of cake. Writers say that the nourishment it contains,(for surely flour, eggs, milk, butter, and sugar, are all nourishing, each in its own way and degree), is in too concentrated a form to serve as nutritious food, and that its tendency is to clog the digestive organs.

The Schoolmaster's Trunk.

I never could have written this charming book, but if I could have done it, how I would have liked the task! The simple, natural style is very charming to me, but the sentiments themselves—to them I cry heartily "amen and amen!"

You see, it is a kind of household reform book, in the guise of an odd sort of story—not story either, but just what it purports to be in its full title: "Papers Found in the Schoolmaster's Trunk." What the schoolmaster wrote his papers for, I do not know, unless just to free his mind—one of the best of reasons perhaps. He seems, like most of Mrs. Diaz's fictitious characters, very natural or real, and I find myself wishing to compare notes with Mr. McKimber, on several points pertaining to domestic science. I quite agree with him that no science is more important.

What the regular "woman's-righters" are thinking about, I can not see, for no mention of Mrs. Diaz and her sturdy blows at woman's wrongs, have I ever seen among their writings, except a few lines by "T. W. H." She seems to me one of the best workers we have, for the genuine emancipation of woman, with much broader views of the whole subject, and much deeper insight of its full meaning, than most speakers and writers upon the subject. Oh dear! How I do want to quote from this book!—for though I believe the same things, I could never "put" them in the same way. Though I "shake in my shoes" for fear of the Editor, when I undertake quotations, I will venture just a little:

"And the idea occurred to me that woman might not have been created mainly for the purpose of getting three meals a day. If she were, thought I, what a waste! for certainly a mere meal-getter might have been fashioned out of cheaper material."

"Since my eyes have been opened, however, these delicacies taste too strong of the toil to be relishable; for I see that the rows of pies on the buttery shelves, the mounds of cake, the stacks of doughnuts, do not come there by any magical 'slight o' hand,' but are wrought out of the very life of poor Mrs. Fennel—literally of her very life."

"Indeed this prying into domestic affairs has made me surprised twice. First, at the amount of physical labor a woman has to perform; second, that she can carry so many things on her mind at one time, or rather that her mind can act in so many directions at one time, and so quickly."

Mr. McKimber became deeply interested in his "science," and studied different persons as his "specimens." One day he spent an hour in watching Mrs. Fennel, at her work as cook, seamstress, tailor, instructor of a learner in house-work, physician for a sick neighbor, judge when the children come with a dispute, preacher on brotherly love to the quarrelling little ones, teacher, trader with a tin peddler—all in an hour before dinner, which comes daily as the grand climax, which must be kept in mind through all the other operations. Then he watched Mr. Fennel for an hour, while the latter pursued his daily employment as a carpenter. Mr. Fennel spent his time quietly planeing and grooving boards. "His movements were distinguished by an entire calmness." "As far as hindrances were concerned, he might have shoved that plane until doomsday, and with a temper smooth and even as his own boards."

"I suppose every scientist has a theory connected with his science. My theory connected with my science is this: that a mother's chief duty is the taking care of her children."—"If 'the three meals take about all day,' and making and mending the evening, where is the children's time coming from?"

"The palate craves enjoyment, and that craving, being a natural one, must be recognized as such. But what I insist upon is this; namely, that gratifying the palate shall not rank among the chief occupations or the chief enjoyments of life, for it has usurped those positions long enough."

"The profusion of viands now heaped upon the table, betrays poverty of the worst sort. Having nothing better to offer, (to company), we offer victuals." "The dishes that make the work and cost the money, are usually eaten after hunger is satisfied, and do harm rather than good."—"Simplify cooking, thus reducing the cost of living, and how many longing individuals, now forbidden, would thereby be enabled to afford themselves the pleasures of culture, of travel, of social intercourse, of tasteful dwellings! And it might be added, at the risk of raising a smile, how many pairs of waiting lovers, now forbidden, would thereby be enabled to marry, and go to—paradise, which is to say housekeeping!"

Patterns for the New Under-Garments.

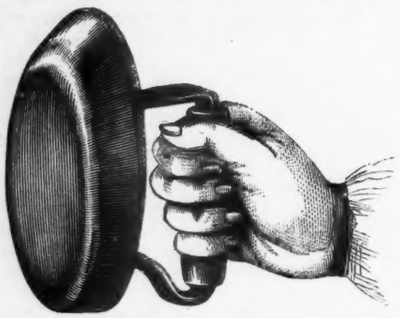
I have been notified that the Dress Reform Committee of Boston, have removed from their former rooms, to No. 4 Hamilton Place, where patterns and garments can be obtained. Any lady can obtain ready made garments fitted to her size, by sending her measure, taken according to directions given in the Committee's circular. The under suits are made either with waist and drawers in one piece, or buttoned together at the waist. I think, from some experience, that most ladies would prefer the latter.

A Cover for the Bread Pan.

The old table-cloth will dip down into the light sponge, you know, unless carefully guarded each time, and the tin pan when covered over the fermenting dough, gets jarred off frequently. But if you suffer such annoyances as these, you can get relief as I have done, by making yourself a regular cover for the bread-pan. I took four or five sheets of coarse brown wrapping paper, ironed them smooth, and cut them round, the size of the top of my bread-pan. Then I basted them together, and covered them on both sides with clean, old calico. Two strips of the same calico, cut twice the depth of the pan, and doubled up so that the strip was then of four thicknesses, were sewed around the edge of the stiff circular top of the cover. I left this plain ungathered frill open on one side, so that I could turn it back when setting it close to the stove-pipe. But last week my bread sponge got the start of me, and was sticking fast to the inside of my new bread-pan cover, before I suspected it of being so light. Of course it was a difficult matter to clean it off properly, and the idea was suggested that an old napkin or any clean cloth, pinned inside the cover, and easily removed when soiled, would save trouble in case of another such accident.

Shirt Bosoms and Collars.

Mrs. M. Erickson says that shirt bosoms and collars, when new, have a smoothness and gloss, which she can not impart to them afterwards. She has tried spermaceti, gum, and other things, in the starch, and yet fails to get the gloss "as good as new." Spermaceti and other forms of grease may help, but she has not yet tried the right kind of grease, which is—elbow-grease, and it is not put into the starch either, but applied directly to the linen. A long while ago we wished to know how this polish was placed on the "boughten" shirts, and, having an acquaintance with an owner of a laundry, we asked if he had any objections to tell us the secret of his addition to the starch.—"No," said he, "it's done entirely by elbow-grease."—This led to an explanation, in which we were informed that they added spermaceti, or whatever the woman at the laundry had a fancy for, but that he doubted if these did much towards it; the whole secret laid in the kind of iron and in the woman who uses it. The iron must be one with a brightly polished face, and the woman must be one with sufficient strength of arm to make it do its work. An iron of the described kind was procured, the ironer told what was expected, and ever since the shirts have been as good as new. These irons are sold at the furnishing and probably hardware stores; they differ from ordinary flat-irons, or sad-irons, in having no sharp corners, the edges being rounded all around, front, sides, and rear, and moreover, the surface is polished smooth and bright. The linen is first ironed in the ordinary way, and allowed to become quite dry; the surface is then slightly dampened by passing a wet cloth over it, and



IRON FOR POLISHING LINEN.

then rubbed, and rubbed hard, with this polishing iron, until the surface of the linen itself becomes polished. Of course one requires a little practice to get the knack of it, but after a while any strong ironer can make very handsome work. Aside from the finer appearance of linen thus treated, there is the great advantage that it keeps clean much longer; the surface being made thus close and smooth, dust does not adhere to it, but instead of settling into the meshes of the linen, falls off from the surface. The engraving shows the form of the iron, which is perhaps a little smaller than those of the ordinary kind.

Stoves—Taking Down and Blacking.

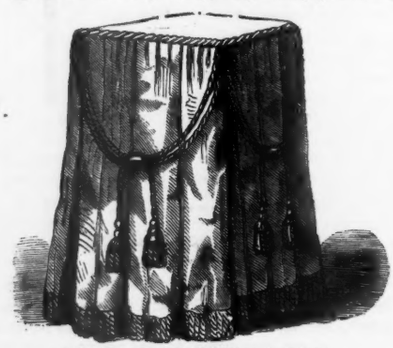
One amusing thing about our correspondence in the household, as well as other departments of the paper, is the fact that several questions will come to us from widely separated points, all bearing on the same subject; now we have within a few days of one another, inquiries from a housekeeper in Spain and another in New Jersey, as to the best blacking for stoves, and how to apply it. As this is a season when many stoves are unfortunately taken down and put away for the summer, their proper treatment becomes a matter of general interest. "Unfortunately," we say, stoves are taken down the present month, but we might have used a stronger word, and had we said recklessly, it would not have expressed our meaning quite so well as culpably. There are those housekeepers to whom the necessity for house-cleaning on a certain day in May has all the force of a commandment—and what house-cleaning under these conditions means, many a reader too well knows, and many a grave-stone stands as a silent witness. We will not enumerate the ills it brings—but among the good it sends away are the stoves—often from every room except the kitchen. A clear cold January day with the mercury at 15 to 20 degrees below zero, is absolute comfort in comparison with a damp day in May, with the thermometer between 32° and 40°. But this is not what we started upon, let us dispose of this almost vital point by saying that in none of the northern states should the stoves be removed from the living rooms, if the health, let alone the comfort, of the family is regarded, before the middle of June. We have pleasant days, and warm, in May, but we cannot remember a year since we have given attention to the matter in which there has not been a cold spell in the first half of June in which a fire was absolutely necessary to the comfort of the well, and the well-being of the ill. "Then why take stoves down at all?" will be asked by some inveterate May house-cleaner. Exactly so—why? Not only can we not see the slightest use in taking down the stoves, if that be the way of heating, but we hold that in country houses there should never be a day in the whole year in which a fire cannot be built at a moment's notice. In summer an open fireplace is preferable to a stove, but if there is no fireplace, leave the stove, for there will be but few weeks in the whole summer in which a little fire in the morning or evening will not be needed to ventilate the room or to dry it, if not to remove the chill. In malarious districts this is of special importance; a few sticks will prevent what much quinine may not cure, and be vastly cheaper. So we insist that in the family or living room of every country house there should always be a fire laid in fireplace, grate, or stove, ready to diffuse comfort when needed, even if it be in July or August. But in houses heated by stoves there are several which may come down without detriment, and those which remain in place should be properly cared for, which brings us at last to

Taking Down the Stoves.

If the stove connects by a short, straight piece of pipe directly with the chimney, there will be little trouble in replacing it next fall; if instead of this there are, as is more commonly the case, several lengths of pipe and more or less elbows, then too much precaution cannot be taken. Some hold the theory that a stove-pipe once taken down can never be put up as it was before without calling in a fitter. Stove-pipes make great havoc with domestic patience, but a proper foresight at the taking down will help greatly to a felicitous putting up. Wherever two ends of pipe, whether sections or elbows, come together, they should be marked, whether intentionally separated in taking down or not. If a large pipe is taken down in the fewest possible pieces, some others will separate, and all be in confusion, hence the only safety is to

Number Each Joint,

that is, whenever two lengths or sections, including elbows, come together, with two numbers, as 1–1, 2–2, etc. Do this before disturbing the pipe; chalk will answer, but the marks must be renewed if blurred by handling, before the pipe is put away for the season. Where anthracite coal is burned, a simple thumping of the pipe will remove the gathered ashes and dust; a pipe to a bituminous coal-stove will show more deposit, and will need a more thorough cleaning, but in those of wood-stoves, the deposit is often very heavy, and, if the pipe is a long



MANNER OF CONCEALING A STOVE.

one, of a highly acid and corrosive nature. If this be not removed when the pipe is taken down now, the work of destruction will go on all summer, and when it is to be put up in the fall, it will often be found completely honey-combed and useless. Hence a pipe of this kind should have every incrustation upon its interior removed by thorough thumping and a brush of twigs. To arrest the corrosion of what deposit remains, the interior may be coated with ordinary lime-wash or whitewash. Both stove and pipe should be thoroughly blackened before they are put away for the summer.

The Object of Blacking

a stove is not solely to improve its looks, but it is to cover the surface of the iron with a coating that will prevent rusting. Sometimes a kind of black varnish is used, which makes the stove look very

well, but when a fire is built it burns off with a most unpleasant odor. We know of nothing so good as plumbago or black lead, and all the stove blackings put up in packets under various fancy names, are some form of this, more or less pure. Black lead is of such a "greasy" nature that properly rubbed upon the iron it will adhere and form a continuous film all over it so as to thoroughly protect the surface from the action of the air, and consequent rust, but it will not resist water, and the stoves should be stored where the rain cannot reach them. The old method of mixing the blacking with water and applying it wet, and then rubbing with a brush with some dry blacking, is founded upon correct principles, and if well done will give a complete covering. All movable parts, such as legs, small doors, and the like, should be placed inside of the stove before putting it away, or there will be much hunting for them next fall.

Concealing a Stove.

If there is no convenient place to store the stove, or for other reasons it is necessary that it should remain in the room where it has been used, it may be, in most cases, easily concealed, and even converted into a sightly and convenient piece of furniture. All that is needed is a board of suitable size to set upon the top of the stove; this has a strip at each corner for a leg; the legs may be braced if need be, and the whole covered and draped according to fancy, with chintz, or other convenient material. The engraving gives the idea, the manner of carrying it out will vary with circumstances.

Another Trap for Rats.

Though there have been in the *American Agriculturist*, from time to time, numerous descriptions of plans for trapping rats and mice, yet the number of methods is not nearly exhausted. "A Subscriber" sends us his method, which he thinks "the best out," and which is explained by the accompanying illustration. He takes a flour barrel or a keg, and ties over the top a sheet of very stout stiff paper, or an untanned sheepskin stripped of the wool. Upon this cover he places corn or meal, and feeds the vermin in this way in some secluded place, until they become fearless of danger, and quite at home upon the cover. He then smears the cover around the center with glue, and sprinkles corn, wheat, or meal upon it, which, when the glue is dry, adhers firmly to the paper or the skin. He then cuts two slits crossing each other, as shown in the engraving, several inches long, by which the central portion of the cover is made very treacherous footing. When the rats run across this center they slip through into the barrel, from which there is no means of escape. The openings instantaneously close up themselves, and other rats follow.

TRAP FOR RATS.

Don't Touch the Children.

BY MRS. E. S. LINCOLN.

Of the many trials that farmer's wives have to endure, not one is more difficult to avoid, and yet none more cruel, than that of having to let one's carefully reared little ones associate with strange hired help. My experience in this line has been such that while I extend a friendly welcome to the stranger, I am mentally crying out to him or her, as the case may be: "DON'T TOUCH MY CHILDREN!" Break the dishes, waste the stores, spoil the meals, let the horses take cold, the colts starve, the cows dry up, the rats run riot in uncovered feed-bins—anything, so long as you leave my little one's untarnished. Everything else can be endured if you don't touch with unclean hand the souls of my children. It seems to me that it is a crime well nigh unpardonable to sully the innocence of confiding little boys and prattling girls, yet there is so much of it done, and their poor mothers are all unaware of the presence of the serpent in their flower garden until it has become impossible to ever again erase his slimy trail.

Not many years since, needing some one to cut firewood for the approaching summer, my husband engaged a lad of seventeen, to whom he awarded the highest praise as a diligent and efficient worker, especially at chopping and splitting wood. From the first, the boy, whose name was Marion, seemed to feel sure of a friend in me. There is in nearly every large family of children one who seems less favored and beloved than the others.—"The black sheep of the flock"—such was poor Marion in his own cheerless home. For days and nights in succession during the summer, when a little boy, he had lived in the woods near their house, coming home for food only when pressed by hunger. His one ambition, he confided to me, was to obtain a good education. Nothing could have appealed more effectually to my heart for the friendless lad than this. Had *I* not known what it was to be compelled to live in ignorance while thirsting for knowledge and culture? To know myself wholly devoid of grace and beauty, to be bashful and awkward, and wholly unable to please while I so longed for mother-love and home petting? Ah, but I had. So I gave Marion my sympathy and pointed out to him the speediest way of reaching his goal.

My boys, aged twelve, six, and four years, liked to go with him to the wood lot where he chopped, to the field and garden when he hoed, and he seemed to be as fond of their company as they were of him. One day while Mr. L. was away, he was employed near the barn, and the children were with him as usual. As I stepped to the porch to call the boys to dinner, I could hear Marion singing loudly. They being out of sight, and not likely to hear my call, I followed the sound of his voice to the farther side of the barn. But, getting near enough to distinguish the words, I found his song to be a most obscene piece of ribaldry, interspersed with foul-mouthed comments of his own, to the hearing of which the wealth of worlds could not have tempted me for one moment to expose my innocent little ones. My first agonized thought was, as I but too well remember, of the weeks that this had been going on, unknown to me. Of course, the boy was instantly discharged, but the contamination that he had brought into my flock was not to be so summarily expelled. I could only mourn in anguish of heart over my children, so cruelly robbed of the priceless gem of soul-purity. I am sure the boy did not intend to cause me such bitter sorrow in return for kindness received. I am afraid that his very earliest existence began in moral leprosy, and that he had not the faintest idea of his own degradation. Poor boy! Never to have known the beautiful innocence of infancy: to put on proper behavior only as one does their best suit, to appear in company! How can such persons become reformed, I sometimes wonder; what, to one who has *never* known purity, is the process of repentance and turning from sin unto righteousness? What sense can the words "ye must be born again" convey to their minds? God only knows. God pity them!

But, oh mothers, be careful not to let them sully your children. You can never press your boy to your heart again with the same proud fondness, never gaze into the dear, deep, untroubled eyes again after the agent of evil has done his work. Be ever on your guard against this source of contamination, or you may mourn in vain when the evil is done.

BOYS & GIRLS' COLUMNS.

Aunt Sue's Chats.

FANCY BOXES.—Ada. A very pretty little box, to hold bon-bons and other small articles, may be made by any "little girl," who has as much "gumption" as you seem to have. Do you see the picture of a hat? (fig. 2). It looks very much like a hat, doesn't it? Well, it is made out of a flat paper-box, such as is used for pills and other little notions, and a round piece of card. Go to a druggist and get a round card-board pill or other box, about 2¾ inches in diameter, like fig. 1. Then cut a piece of card into a circle of about 4 inches diameter, and with strong white thread sew the bottom of the pill-box to the larger card, right in its center. Never mind if the stitches show, the candy will hide them on the inside, and the Japan varnish on the outside. It must be sewed very firmly, so that lifting the cover off the box shall not break the stitches. Now I must tell you how to make the varnish. It is composed of shellac, lamp-black, and alcohol, subjected to a gentle heat. But you can make it in a much more simple way from black sealing-wax; break the wax into very small pieces, and put them into a wide-mouthed, well stoppered vial. Cover the sealing-wax with alcohol, put the vial in a warm place, shake it occasionally, and in two or three days the varnish will be ready for use. Now paint or varnish your hat with it. It will not take long to dry, but don't apply it to the upper and the under parts both at one time; let one part dry thoroughly before you paint the other. Now take about a quarter of a yard of narrow black ribbon, and tie it around the hat, and if you can paint the name of some vessel on it, it will look more finished. The sealing-wax varnish is a very handy thing to have in the house, as it is often useful in freshening up a shabby work-basket, for instance, or other little article. If you prefer red varnish, use red sealing-wax. Remember that this, like all other varnishes, takes fire readily, and when at work, keep it at a safe distance from the lamp and fire. Keep well corked, and when too thick, thin carefully with alcohol. You will have to give the hat three or four coats of varnish perhaps, so don't be discouraged if after the first coat it should look like a "singed cat."

Fig. 1.—BOX FOR THE HAT.

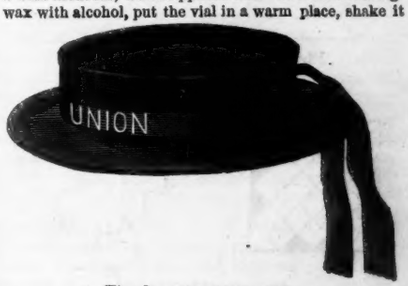
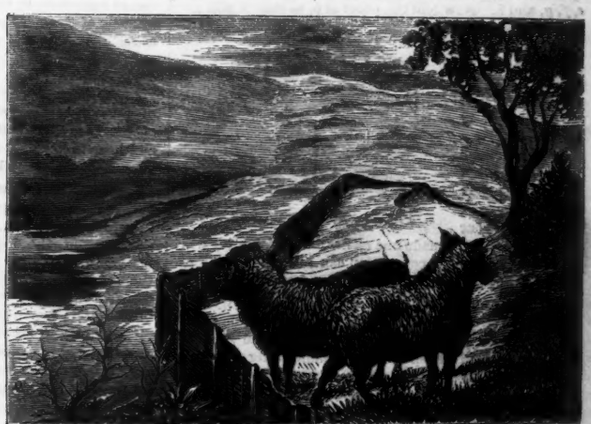


Fig. 2.—HAT COMPLETE.

MINERVA G. H. asks me if I can tell her "how to make something for the little ones, as fascinating as paper



No. 444.—Picture Puzzle.—"The Old Man of the Mountain" is there, if you can only find him? Come, you of sharp eyes and quick wits, and point out the venerable gentleman. The mountain is a dreary one, and no wonder he looks lonely.

windmills?"—Yes, Minerva, I think I can: paper-boxes are just as "fascinating" and just as useful. I have seen young ones kept quiet with them for an entire morning. For the benefit of those who don't know how they are made, I will describe their construction. Take a square of writing-paper, say about the width of ordinary note-paper, or of any size you please (fig. 1). Fold the diagonal corners together, as in fig. 2, and crease it across; now fold it across, with the other corners together, so that the creases shall just cross the square like an X. Now open it, and bring the two corners to the center of the X, and crease the folds, as in fig. 3. Fold

Fig. 1.

Fig. 2.

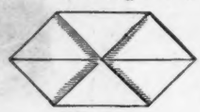


Fig. 3.

it between each two creases, as in fig. 4. Now turn the square, and crease it seven times across, the other way, until the paper is folded in squares, like fig. 5; then take

Fig. 4.

Fig. 5.

Fig. 6.

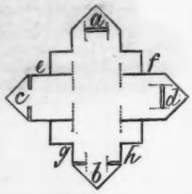


Fig. 7.

your scissors and cut out the little triangular sections blackened in fig. 6, and your paper will be shaped like fig. 7. Now put the point of your scissors carefully through the little black lines at *a* and *d*, and make slits (like button-holes); then cut the black lines at *b* and *c*, as far as the dots, *and no further*. Cut the black lines at *e*, *f*, *g*, and *h*. Now fold the point at *b*, so that it will go through the slit at *a*, and when you have passed it through, straighten it carefully out, as in fig. 8. Now pass the point *c* through the slit *d*, and your box will be complete, and when your "little sister" has made one *all her own self*, her joy will be complete too. Of course you can make a "nest" of boxes by gradually increasing the size from the smallest.

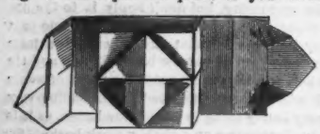


Fig. 8.—BOX HALF TOGETHER.

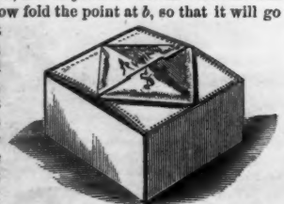


Fig. 9.—BOX COMPLETE.

"A FARMER."—The magic square trick is pretty well understood by our puzzlers, and it is no more difficult to arrange 9801 squares, than it is to arrange nine squares. But if you would transpose the columns, after you have written them mechanically, the plan of construction would not be so obvious. I append a sample by way of example.

35	47	22	41	4	10	16
11	23	5	17	29	42	48
36	6	30	40	12	18	24
19	31	13	25	37	43	7
44	14	38	1	20	26	32
27	39	21	33	45	2	8
3	15	46	9	28	34	40

These columns add up to 175, perpendicularly, horizontally, and diagonally.

A. R.—No. We are always glad to find that our puzzles have afforded amusement and instruction, but offer no "premium for the most answers."

WILLIE S.—Alphabetical arithmetic is solved by the same process as cryptography, or cipher-writing. You must find the key by patience, perseverance and ingenuity. If in the commencement of a sum you subtract H, from H, and the remainder is Y; you may be very sure that Y represents the cipher nought, and that "nought" may prove the key to the whole sum.

MARY S.—You will find a "concealed river" in the following sentence:—Give me some of that ham, Esther. The river is "Thames," and to form it, you take t from "that,"—"ham," and es from "Esther." Now do you see it?

Value of Metals.

The following table gives the approximate commercial gold value of a *pound* (avoirdupois) of the metals named. It will be seen that eight of them are more costly than gold. Iridium is much used for the points of gold pens, on account of its hardness. Platinum is now much used because of its infusibility, while, like gold, it is not attacked by any single acid, and does not rust. It was, until recently, more costly than gold; and it is the heaviest of all metals. Aluminum is the metalic base of clay; it resembles silver, but is many times lighter, and tarnishes as little as gold or platinum. On this account, and on account of its lightness, it will come into large use when improved processes render it easily obtainable. But a few years ago it was worth perhaps a hundred dollars an ounce, merely as a curiosity, but new methods of extracting it have greatly cheapened it. As clay is abundant, the supply of aluminum is unlimited, though at present it is not obtained from clay, but from a mineral very abundant in Greenland, and from which it is more readily extracted. Though the cheapest, iron is intrinsically the most valuable of all metals. A colony on an island, shut out from all intercourse with others, would make more *useful* things—implements, knives, needles, etc., out of 100 lbs. of iron, than out of 100 lbs. of gold or other metals. Steel is simply iron, with a little carbon (coal or diamond) in it:

Iron (1 lb)	$0.02	Aluminum	$40.00
Lead	.07	Magnesium	46.50
Zinc	.11	Chromium	58.00
Arsenic	.15	Thallium	108.77
Copper	.25	Platinum	115.20
Tin	.33	**Gold**	301.45
Antimony	.36	Iridium	317.44
Mercury	1.35	Osmium	325.28
Nickel	2.50	Uranium	576.58
Sodium	3.20	Palladium	653.00
Bismuth	3.63	Rhodium	700.00
Cadmium	6.00	Ruthenium	1400.00
Cobalt	7.75	Vanadium	2520.00
Silver	18.85	Indium	2520.00
Potassium	23.00		

The Doctor's Talks.

At last my young friends seem disposed to take me at my word. I have often hinted, indeed directly stated, that I am always pleased to hear from them, and the more intelligent questions they ask, the better I shall like it. By their questions I can know what they are interested in, and what they are talking and reading and thinking about. Of late I have had quite a number of letters, and my "Talk" must this time be devoted to things suggested by them; these letters are apparently by some of the older boys, but the younger boys, as well as the girls, will not be forgotten. I can not answer at once all the letters I have at hand, and others must wait a while. There is one kind of questions I hope you will not ask, those about medical matters; there are very few of these that boys and girls need to know anything about; I have had nothing to do with medicine for years, and hope to keep out of it all my life. Now one of our youngsters wishes to know

ABOUT HYDROPHOBIA, Master "W. P.," Clermont Co., O., who asks quite a numbe of questions about it, which no person in the world can answer properly. Even those physicians who have given the most attention to the matter, are obliged to admit that there are many things about it which they do not know. The disease is of very rare occurrence, and as, so far as known, it is incurable, persons are naturally in great fear of it. We can answer one of our young friend's questions: it is not caused by hot weather, as it is found to occur quite as frequently in cold months as in the others. The best way is to avoid all sick dogs, and not to give the matter any anxious thought, as persons can make themselves very unhappy by allowing their minds to dwell upon such things.

TANNING SMALL SKINS.—Here is my young friend "W. L.," who writes from Massachusetts, asking me how to tan small skins. I have done a great many odd jobs in my life, but I don't think I ever tanned a skin; but as the next best thing to it, I have been told how to do it. Several years ago I was in the great wilderness of northern New York, a part of which is now so famous as the Adirondacs, and had for a guide a famous old trapper. I saw that he had a cap made of some nicely dressed skins, and I asked him to tell me how to do it. His instructions if put in print, would read thus: "Yer git some ellum, some Peter, and some salt, and mix 'em."—"Hold on a minute, what do you mean by ellum—not slippery elm?"—"No, this white stone ellum you git down to the settlements"—"Oh, Alum! and the Peter?"—"That's what you pickle beef with."—"Saltpeter, well, Alum, Saltpeter, and salt, what then."—"Pound 'em as fine as you can git 'em, and then——"—"But how much of each?"—"How much, why say a han'ful of the ellum, and a han'ful of salt, and half a han'ful of Peter; you have 'em fine and mix 'em good, then have all the little bits o' meat and fat pulled off of the skin, and sprinkle the stuff all over the inside on't."—"How much?"—"Well, put it on good, till the skin looks white, 'like a barn-door in a frosty mornin'—then you turn in the edges, and roll the skin up tight, and jest let it alone for three or four days."—"What then?"—"Then you take the skins down to the run, and kerslosh them about in the water until the stuff is all off, then you give 'em a wash with soap and water, and hang 'em up to dry."—"Is that all?"—"No, 'cause they would dry hard and stiff, so when they begin to dry, you must pull and stretch 'em—pull side ways, head and tail ways, and criss-cross, everyhow—and the more you pull onto 'em, the slicker and softer they'll be."—All this was told with much side talk by the camp-fire many years ago, and I never supposed I should have any use for it. Perhaps you will see that you need two parts each of alum and salt, and one part of saltpeter, all fine, sprinkle the flesh side of the skin with this, enough to make it white, roll up for 3 or 4 days; wash first with clean water, then with soap and water, and pull while drying.

ABOUT FREEZING.—Master "L. B.," in Illinois, writes, "what makes water at times freeze onto the bottoms of rivers, and not freeze on the top; again it will freeze in the pail, or rather become one mass of slush ice."—The formation of ice at the bottom of a body of water, is not a very common occurrence, and its doing so at all, has been a puzzle to philosophers. Such ice is known as "anchor ice," from its being found at the bottom, and the explanation given is this: You all know that 32° is the freezing point of water, but water does not always freeze when cooled down to 32°. Pure water cooled very slowly, and kept without the least disturbance of its surface, has had its temperature lowered to 21°, without becoming solid; but the slightest motion caused it to become ice at once. Anchor ice is formed in very cold and very still weather, when the whole body of water has cooled to 32°, and on account of the great tranquility has not frozen; it is supposed that the water being all at the freezing point, the ice forms first on the bottom, because of its roughness; the stones, sticks, and other substances, afford points to which the crystals of water may attach themselves. You know if you have a solution of alum, or a strong syrup of sugar, in a smooth vessel, and put in a string, stick, or other rough substance, the crystals of alum and sugar, will form on the rough surfaces of these, in preference to the smooth sides of the jar or other vessel. The ice under the conditions mentioned, seems in a similar manner to prefer to gather upon the rough surface of the bottom, to forming upon the smooth surface of the water. I understand you to say, though you have not expressed it so positively as I wish you had, that this same water in which anchor ice had formed, turned into slush ice when taken up into a pail. This would be very good evidence that the water had cooled to 32°, or below, without freezing, the disturbance of taking it up causing sudden freezing to occur. It is said that anchor ice sometimes forms to the thickness of three inches, and when it can break away from the substances to which it is attached at the bottom, it rises to the surface like other ice. This is a very interesting matter, Master B., and I hope that when another opportunity occurs, you will see if the conditions are as I have above named; observations on the temperature of the water, and that of the air, with the thermometer, and the condition of the air as to tranquility, will help you to decide how far this explanation meets your case.

WHAT MAKES THE ICE GROAN?—The unusual cold, and its long continuance the past winter, have set my youngsters to thinking about the things that belong to winter, for here is "T. G.," in New Jersey, would like to know what causes the ice to make a noise in winter. He does not say a "groan," but in some countries people are superstitious enough to think these noises a groaning that foretells some evil. The cracking and snapping of ice is easily accounted for. As you are aware, solids generally expand with heat, and contract when cooled; but water has the curious trick of expanding with the loss of heat, after it has cooled down to 39°; still when it has become solid ice, that obeys the usual law, and indeed contracts more rapidly by loss of heat, than any other solid. Now if a pond or stream is covered with ice, and the temperature sinks to zero and below, the sheet of ice will contract, and as it goes on shrinking, the weakest part must give way, which it sometimes does with a loud bang. A loud report will at a distance sound like a dull rumbling, which those who very much wish to do so, can make sound like a groan.

JOHN O'GROAT.—"E. J.," Missouri, Miss., wishes to know who John O'Groat was, and what worthy thing he did.—I can not tell who John was, other than that he, as his name would show, was a Scotchman; the only thing so far as I know, that he did, was to give his name to nearly the northernmost point in Great Britain, where his cottage once stood; the place is in the county of Caithness, Scotland, very near the sea, and though the cottage is gone, the place is still called John O'Groat's House. People in Great Britain say, to express extremes of distance, "from Land's End to John O'Groat's House," that is from the farthest south or south-western point to the most northern point, just as we say "from Maine to Georgia," and in olden times it was "from Dan to Beersheba."—Your other questions about two persons traveling, one east and the other west, is an arithmetical puzzle that has been discussed for years; if I come across anything about it, I will give it to you, but I have not the time to give to the working out of the problem, as I do not think the result will pay for the labor. THE DOCTOR.

Curious Bible Notes.—It is said that a prisoner in solitary confinement, by working three years, obtained the following items: The Bible contains 66 Books; 1,189 Chapters; 31,173 Verses; 773,602 Words; 3,686,489 Letters....The word LORD occurs 1,855 times; the word AND 46,277 times....The shortest verse is John xi. 35; the longest verse, Esther viii. 9...Ezra vii. 21, contains all the alphabet except J....2 Kings xx., and Isaiah xxxviii. are similar; and in Psalms cvii. the 8th, 15th, 21st, and 31st verses are alike....All the verses of Psalm cxxxvi. end alike. We have verified the first two and the last six items above, and suppose the figures for the verses and words are correct.

Aunt Sue's Puzzle-Box.

ANAGRAMS.

1. Ironed dunces.
2. Not cousins.
3. Bound legs.
4. So mend paces.
5. Tigers in den.
6. A fair dose.
7. Cured Danny.
8. Cid echo psalm.
9. Defines fuss.
10. I'm a lay partner.

BIBLE EXERCISE.

(Give the names, in an alphabetical list, here defined.)

A. Father of light.
B. Seventh daughter.
C. Green herb.
D. Little woman.
E. A bunch of grapes.
F. Happy or prosperous
G. Valley of Grace.
H. Exaltation of Life.
I. A man of murder.
J. A revenger.
K. The city of the woods.
L. A she-wolf.
M. A comforter.
N. The gift of God.
O. Servant of the Lord.
P. Small.
R. A rose.
S. Myrrh.
T. Well educated.
U. Strength of God.
V. One that drinks.
Y. Memory of the Lord.

G. C. W.

CHARADE.

A verb that often lends its aid
Unto composing youth or maid,
United with a word not large,
Names one who, in the public barge,
With head erect, imposing form
Encased in garments fine and warm,
Without a single eyelash quiver,
Sails calmly down the golden river. HENRY.

NUMERICAL ENIGMAS.

1. I am composed of 27 letters:
My 17, 6, 27, 19, 26, 14, 8, is a man's name.
My 21, 25, 15, 12, 5, 23, 2, is a wild animal.
My 10, 3, 7, 1, 25, 24, 3, 7, is a man's name.
My 4, 11, 18, 22, 1, 13, is a number.
My 9, 16, 20, 23, is useless.
My whole is an old saying. HERBERT J. K.

2. I am composed of ten letters:
My 2, 6, 8, is an insect.
My 7, 10, 2, 8, is another insect.
My 4, 9, 7, is an animal.
My 3, 4, 9, 1, is something to exhibit.
My 5, 8, is a pronoun.
My whole is a Territory. HARRY H. BRAKELEY.

ACROSTIC.

The initials from a lesson that all should learn.

1. A prince of ancient Wales. 2. A late Methodist divine. 3. A Persian general. 4. An Episcopalian divine. 5. Pertaining to the sea. 6. A species of dove. 7. A late sovereign. 8. A useful tool. 9. Part of the human body. 10. A city of New York. 11. A stinging insect. 12. Old-fashioned. 13. Another stinging insect. 14. A scream. 15. An article of clothing. 16. A picture. 17. Another kind of picture, 18. The mouth of a river.

LITTLE ONE.

CONCEALED STATES AND COUNTRIES.

1. How swiftly the ape runs, does he not?
2. Well, Farmer Brown, do you hire land?
3. Oh! I owe you fifty cents, do I?
4. Has that ore gone to the foundry yet?
5. James, I am going to the concert to-night.
6. But you can see Ida home, if you like.
7. It is painful to witness such destitution.
8. The bark "Alice" landed here to-day.

ALBERT AND AUGUSTA.

DECAPITATION.

When shot from bow with steady nerve,
Seldom from the mark I swerve;
But when the tyro tries to hit
It, far and wide I often flit.

Behead: the thrust by ruffian dealt,
Is stopped by me, though still it's felt;
Behead me once again, and now,
You'll never find me near the prow. HENRY.

CROSS WORD.

My first is in bread but not in roll,
My next is in rat but not in mole,
My third is in ale but not in beer,
My fourth is in bison but not in deer,
My fifth is in Bill but not in Joe,
My sixth is in rain but not in snow,
My seventh is in one but not in two,
My eighth is in Susan but not in Lou,
My ninth is in night but not in day,
My tenth is in August but not in May,
My eleventh is in chisel but not in saw,
My twelfth is in teeth but not in jaw,
My thirteenth is in mouse but not in rat,
My fourteenth is in lean but not in fat,
My fifteenth is in wren but not in lark,
My sixteenth is in bite but not in bark,
My seventeenth is in me but not in you,
My eighteenth is in purple but not in blue,
My nineteenth is in ton but not in pound,
My twentieth is in square but not in round,
My twenty-first is in Jupiter but not in Mars,
My twenty-second is in sun but not in stars,
My twenty-third is in Mary but not in Jane,
My twenty-fourth is in wheat but not in grain,
My twenty-fifth is in prison but not in jail,
My twenty-sixth is in thresher but not in flail,
My twenty-seventh is in grass but not in weed,
My whole is a book that I like to read.

CAPT. JOHN W. W.

PI.

Hypap si eh how nac kate rawginn romf het sipsham fo throes.

SQUARE WORDS.

Square the words "ASTER" and "SPAIN."

GILES FARMIN.

ANSWERS TO PUZZLES IN THE MARCH NUMBER.

ANAGRAMS.—1. Humiliate. 2. Galvanize. 3. Resonant. 4. Velocipede. 5. Ligatures. 6. Legislature. 7. Predominant. 8. Ancestors. 9. Utopian. 10. Curmudgeon.

CONCEALED NAMES.—Bridget, Lucy, May, Ella, Cora, Edwin, Mary, Grace, Amos, and Ida.

DOUBLE ACROSTIC.

S- ahar -A
C- a -B
O- sag -E
T- rafalga -R
L- aplan -D
A-Palache-E
N- eus -E
D- o -N

CITIES.—1. New Bedford. 2. Aspinwall. 3. Pondicherry. 4. Georgetown.

NUMERICAL ENIGMAS.—1. National. 2. "People will talk."

SQUARE WORDS.

1. C L O D	2. B O A T
L A K E	O G R E
O K R A	A R T S
D E A R	T E S T

CROSS-WORD.—Charles Sumner.

DECAPITATIONS.—1. Robe, obe. 2. Grate, rate. 3. Clash, lash. 4. Crash, rash. 5. Gloom, loom. 6. Shark, hark!

PI.—Time is the most subtle yet the most insatiable of depredators, and by appearing to take nothing is permitted to take all.

PARAPHRASED PROVERB.—Time, thyme; and Tide, tied Walt, weight; For, four; No man.

Thanks for puzzles, letters, etc., to Xeryion, Frank H., C. W. B., Kipp (or Xipp), J. A. M., A. R., E. S. D., B. F. O., Emily, L. W. G., Harry J., S. T., Minnie W., and J. W. C.

Send communications for the Puzzle Box to Aunt Sue, Box 111, *P. O., Brooklyn, N. Y.,* and *not* to 245 Broadway.

May and May-day.

Last month we had to go a long way back to find out how April got its name; and we shall find the same thing necessary with other months. Why May is so called, does not seem to be well settled. Some say it was named from the Maia, who was the mother of Mercury. The ancient Greeks and Romans had a great many gods and goddesses. Neptune was the god of the sea. Flora was the goddess of flowers, and so on. Mercury was the messenger of the gods—ran of errands for them, and Maia was his mother. These old fables we laugh at now, but we are obliged in various ways to remember them, for we can not look at the thermometer without being reminded of Mercury, after whom the metal was named, and the same name is found among the planets. In this month the ancients had celebrations in honor of Flora, and that custom was continued, and was the origin of the celebration of May-day, which has been a holiday in England from the very earliest time until now. Going into the fields to gather flowers, and choosing a "Queen of May," is still the custom in England. Some try to follow this custom in our northern states; they find but few flowers, and generally come home very cold and cross. North of Virginia, May-day, as a holiday, is a failure, and, however we wish to keep up the customs of our great grandfathers and grandmothers, it is in most places much pleasanter to observe the holiday in June.

The Kind of Lead in Pencils.—"John C. C.," Ohio. You are right. The "lead" in lead-pencils is not lead at all, though it is called "black-lead." The weight, if nothing else, tells you that. It is a mineral, called *graphite,* (from the Greek word to write), and is more nearly related to coal than to lead. You have learned that both coal and the diamond are forms of the element, carbon: Graphite is still another shape in which carbon is found; it usually contains a very little iron. Plumbago is another name for it. It can not be melted, but at a very high heat, will burn. The fine kinds are very scarce. This answers your question, but much more could be said about it, and we may tell it some day.

A True Dog Story.

Some months ago we asked for stories about dogs, several have come in, and we should be glad of more. A well known literary gentleman, gives this for the boys and girls: One of our old friends, (he is a large Newfoundland dog,) makes his way through the world on three legs. Several years ago he lived in the country. One day he was frolicking about in a meadow, in which a mowing machine was working. Suddenly he gave a spring directly in front of the knives, and in a twinkling one of his legs was cut off a little way above the foot. With a yell and a bound he was quickly out of further danger, but almost immediately returned, on his three remaining legs, to where the accident occurred. After smelling about for it, he found the missing leg, took it in his mouth, carried it to the house, and up six steps of a piazza, when he laid it down before one of the family, and looking up piteously, said as plainly as a dog could, "please fix it for me."—The dog being too valuable to lose, he was taken to an outbuilding, the wound carefully dressed, and in a few weeks the stump healed over. After getting about again, he hunted up the missing leg, which had been thrown into an adjoining field, and buried it. *This* dog evidently had his *thoughts* about him.

Answers to Aviary Puzzle No. 443, (April).—In this some of the figures alone represent the name of the bird, such as *kite,* while with others it is necessary to combine two, as L—ark, for lark. 1 and 10, Cedar Bird.—3 and 2. King Fisher.—4. Crow.—5. Kite.—6. Diver.—7. Whippoorwill.—8 and 10. Snow Bird.—9. Jay.—10. Black Bird.—11. Finches.—12 and 10. Butcher Bird.—13 and 10. Cat Bird.—14. Lark.—15. Rail.—16 and 10. Thistle Bird.—17 and 10. Tailor Bird.

Some Strange Insects.

In this country we often meet with people who believe in signs and warnings, but we do not have nearly so many such persons as are to be found in some parts of Europe, where there is very little education among the working people. In many farming districts in England, there are stories told about most of the common plants, insects, and other animals, that have been handed down from father to son, and mother and daughter, for these hundreds of years. Sometimes a person curious in such matters, will gather up the "folk-lore" as it is called—(which means the knowledge of the people), of his district, and publish it in some book or magazine, and very amusing reading it sometimes makes. In Europe there is a sphynx, or night-flying moth, related to those you see about the flowers at dusk, having upon its back some light markings, which, if you try hard to make them, look somewhat like a skull and cross-bones, and is called the "Death's Head Moth." Of course an insect, bearing such an unpleasant badge as this, would excite the fears of the ignorant, and when we add to this the fact that it is capable of making a kind of squeaking noise, we have materials for very wonderful stories. As this moth is frequently mentioned in books and other writings, we give a picture, that you may see what it is like. It is found in England, and on the Continent of Europe, and its appearance is regarded by the ignorant everywhere as a sign of evil. It is sometimes thought to foretell war, or famine, and should it, attracted by the light, enter the room, and flying at the candle, put it out, there is sure to be a death in the family—and then the poor thing, probably from having burnt itself, gives out its squeaking noise, which is regarded as moaning over the fearful thing which is to happen. But it is not necessary to tell you more of the absurd stories, and surely not to tell you that the coming and going of this moth has no more meaning than that of any other moth or other insect. Really the only harm done by the moth, with the unpleasant name, is to steal the honey away from the bees.

.....Among the insects about which wonderful stories are told, are the lantern-flies—not the fire-flies that we see on a warm summer's night, nor those curious beetles from the West Indies which shine so brightly, and which are sometimes brought here alive, but some South American and Chinese insects, which have a very large head, and a turned up, sort of half transparent, snout, like the one in the engraving. Travelers have told great stories about these living lanterns; they flew into the thick trees, and lighted up their darkest recesses; one lady had some presented to her in a box, and when she opened it, a stream of flame came out; and this same lady is said to have made a drawing of the insect by its own light! Beautiful provision of Nature, is it not, that the insect should be provided with this lantern of a substance like thin horn, to light its way about. The only trouble is that no scientific travelers have been able to see this lantern lighted, and though there is a capital place for a light, it is stated that there is none. On the other hand, it has been suggested that this insect may give light at some seasons, and not at others. So when you read the accounts of the wonderful lantern-fly, you can say that up to the present time it is "not proven."

The Long Saturday Afternoon.

The title above is the name the artist gives to the picture. Boys, don't you think that the artist has "been there?"—Can you conceive of any more irksome position than that of the youngster turning away at the

THE LANTERN FLY.—(*See page* 191.)

grindstone, knowing that all the while his playmates are waiting outside for him to join them in a game or in a ramble through the woods? "It's mean, that's just what it is, to make that boy turn the grindstone," do some of you say? Now that is not what the picture is given you for, and we do not wish to encourage any such feeling as that. "Is there any thing meaner than turning a grindstone?"—Yes, there are a great many things meaner. It would have been much meaner for the boy, when he saw his father coming with the ax, to slink away and get out of sight, shirk the work instead of standing up to it manfully, if it is disagreeable, as this sturdy youngster is doing. We agree, because we know from experience, that turning a grindstone is irksome, and if the tool is dull, and is held on hard, it is far from being easy work. Still every farmer's boy almost, has some time or other to do it. If it would take a hired man from his work, and perhaps leave a team standing idle at a time when every hour was precious, wouldn't you *volunteer* to turn the stone, and feel that you were being useful? In this world everybody who is of any use in it has to work in some way or another, and while turning the stone is not the kind of work one would choose, somebody has to do it, and the boy who can help the work of the farm go on regularly, is in part repaying the many things that are done for him. Why not turn the grindstone? Look at that little chunk of a fellow; he has no doubt arms that are hard and strong, and would tell in a rough and tumble play against a much larger boy. Many a city youngster who is lank, thin, and flabby, has several dollars a month paid for him that he may go to a gymnasium, where he can pull at weights, and climb a rope to try to get some exercise, and all this is probably done at the top of some high building, where there is poor air and not very good light. Here is this boy having his gymnasium all for nothing, and his exercise is doing some good; besides, he has the free air, the bright sunlight, the smell of the hay in the barn, and of the flowers without; the birds are singing, fowls cackling, crickets chirping, and all is so different from the city, that the boy is "getting up his muscle" under conditions that money cannot buy. "But it is so tiresome, there is so much sameness about it, turn, turn, turn, and one turn just like another."—Well, can't you think? To most kinds of work you must give both your body, and your mind, but in turning, you need only give your body. Main strength is all that is needed. The next time you turn the stone, see if you cannot so occupy yourself that the work will not seem irksome. You might count how many turns you make, that would be better than nothing, but not very instructive.—"But what can one think of when he turns a grindstone?"—Well, suppose you begin with the grindstone itself. "A stone, but not like most other stones, a kind of sandstone called grit. Now we know that all sand and pebbles must once have been parts of a solid rock, ages and ages ago this rock must have been broken up by ice or fire or ground up somehow, into little grains of sand; then these grains must have been carried along a rapid stream to a still place where they settled; then, oh how long ago! this water disappeared, and there was the sandy mud which grew harder and harder, it may be by pressure over it, but it was so many thousand years ago nobody can tell, and at last it was hard as we see it now. Every sand-stone is not a "grit," and will not do for grindstones. Only that from very hard rock will answer. Then some one discovered the quarry, and such a drilling and blasting, such a hammering and pecking to get it out! It may have been in Ohio, or perhaps in Nova Scotia, for those are the two great places for these stones, somebody got this one out, and after a while it got here, and here it is, and I turn, turn, turn."...."I wonder what it all does. I turn the stone, the stone sharpens the ax—as I turn, turn, turn. Oh I know, the Doctor talked about particles, and there are too many particles of steel around the edge of that ax, and I must knock them away with the hard particles of sand of the grindstone. As I turn a particle of sand hits a particle of steel and off it goes—turn, there go some more; turn, turn, turn—whew how the little bits of steel get away from the edge of that ax; let's give em some more, turn, turn, turn, that's it old fellow. You grindstone just do your part and I'll show you the virtue of grass and grain—yes, grass and grain. Didn't the ox eat grass and grain, and didn't I have a beefsteak for dinner, and isn't the grass and grain making a revolution with this grindstone. Hurrah for science, it tells all about turning grindstones and the revolution of the earth on its axis. I wonder what turns that, it must be a big job."....."Splash! now I don't want the water coming at me at that rate. Wonder what they use water on the grindstones for at all? It makes a muss. Didn't the stone get wet enough while it was being made? Let's see. I

THE DEATH'S-HEAD MOTH.—(*See page* 191.)

tried to grind my jack-knife one day with a dry stone, and didn't I make the sparks fly; my knife turned all sorts of colors, and John said I had heated and taken the temper all out of it. I know it was never good for anything after that. Oh, I know, they put the water on to keep the ax from getting heated and spoiled, as I turn, turn, turn....I wonder where that heat comes from —— "That'll do, my boy, you never turned so well before."—"Yes, and I haven't half got through with the grindstone story," you think. You see it was a kind of work that you couldn't put much thought into, and you had to occupy your mind with something else while the hands were working mechanically. In much of our work it is not the body that gets tired so much as the mind, but there is very little work that boys are set at that really uses up the body as much as a turn at foot-ball or other active games....If you do not like our way of making the work of turning seem less tedious, you can try Pat's. Pat was a laborer employed at a ship-yard to turn a grindstone. There were a great many men working there, and so many tools needed sharpening that Pat was kept constantly turning from morning until night, and very tired he got. One morning the foreman came early to the yard, and saw Pat turning away at the grindstone all alone, with no one holding a tool. He asked: "What are you doing there, Pat?"—"Faith, sur, I was just tryin' to git a few turns ahead."

THE LONG SATURDAY AFTERNOON.

Easter.—"One of our boys" in Pennsylvania wishes to know why people eat eggs on Easter; he is a very matter of fact boy, and "can see no sense" in the custom. Easter is the day on which the resurrection is celebrated, and on that day it has long been the custom to make presents of colored eggs. A live bird comes out of what seems like a dead egg, and this was supposed in some manner to represent the resurrection—life coming out of death. Whether this was the origin of the custom or not, the giving of eggs on Easter was practised over 400 years ago, even by kings, who had them handsomely ornamented. At the present time it is the custom in some places to have colored eggs, and children play games with them to try which has the hardest shell. The custom has come down through these many generations, and if, as our young friend thinks, there is "no sense" in it, there is certainly no harm in eggs on Easter.

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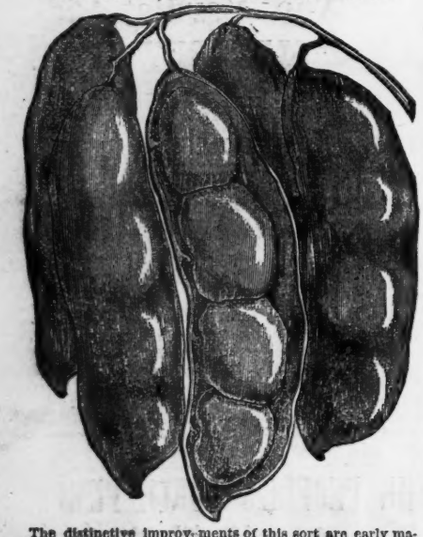

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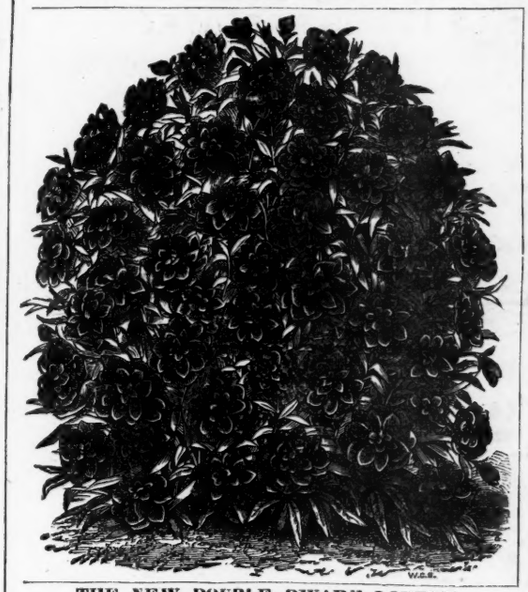

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Elegant Books on Gardening GIVEN AWAY

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Settees and **Chairs** with ornamental open work seats, combining **coolness, comfort, strength,** and good taste.

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Made from Natural Growth of Wood.

The most attractive, ornamental, and durable embellishment of the garden and portico in summer, and for window decorations in winter.

SUMMER-HOUSES FITTED UP,
PARKS EMBELLISHED,
COUNTRY SEATS BEAUTIFIED.

Having the most extensive manufactory in the United States, we are prepared to fill orders of every kind, from a single bird-cage, to the complete furnishing of a park with rustic work. Send for Illustrated Circular and Price-lists.

Address **JAMES KING, New Haven, Ct.**

100,000 VERBENAS IN 100 VARIETIES.

Verbenas by mail, 20 strong plants for $1.00; 100 for $4.50; 1,000 for $40.00. By Express, 50 for $2.00; 100 for $3.00; 1,000 for $25.00. All strong and healthy. Our strain of Verbena Seed will produce more first-class flowers than any other in the market. 20 cts. per packet; 5 packets for 75 cts. Send for our New Catalogue of Seeds and Plants. W. F. MASSEY & CO.,
(late Massey & Hudson,)
Chestertown, Maryland.

ROSES Fine everblooming and other roses sent safely by mail post-paid everywhere, and their safe arrival guaranteed.
6 for $1; 14 for $2. A splendid premium rose with each package when **ten cents** is added. A large collection of **bedding plants, shrubbery, &c. CATALOGUE FREE TO ALL.** Address
JOSEPH T. PHILLIPS,
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12 choice Roses, assorted Colors, sent by mail for $1. Always give satisfaction. Lists free.
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BEAUTIFUL EVERBLOOMING

ROSES

STRONG POT PLANTS
Suitable for immediate Flowering. Sent Safely by mail, post-paid.
Five Splendid Varieties, purchaser's choice, $1; 12 do., $2.
For 10 cts., additional, we send
MAGNIFICENT PREMIUM ROSE.

Our elegant Spring Catalogue for 1875, describing more than two hundred finest varieties of Roses, and containing full directions for culture, with chapters on Winter Protection, Injurious Insects, &c., &c., is now ready, and will be sent to all who apply.
THE DINGEE & CONARD CO.,
ROSE GROWERS,
West Grove, Chester Co., Pa.

MEYERS & ALLEY, Wholesale Dealers & Commission Merchants
IN GREEN FRUITS AND PRODUCE.
83 MURRAY ST., NEW YORK.

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(Established 1845.) **No. 279 Washington-st., N. Y.**
Reference, *Irving National Bank.*

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Averill Chemical Paint.

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AVERILL CHEMICAL PAINT CO.,

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The incorporation of RUBBER in our paint makes it *unequaled* by any other. It is unaffected by change of temperature, and is perfectly waterproof. It presents the finest possible finish, will not crack or peel off, and is in every way the "*Best Paint*" for either inside or outside painting, is from one-fourth to one-third cheaper, and lasts three times as long as the best lead and oil paints. The almost *unanimous verdict* of the many thousands who have used our paint is that it is *far superior* to any other paint in use.

Be sure that our TRADE MARK, (a fac-simile of which is given above,) **is on every package.**

The great popularity of and demand for our paint has necessitated the establishing of "*Branch Factories*," as follows:

No. 506 West street, New York City; No 83 West Van Buren street, Chicago, Ill.; No. 210 South Third street, St. Louis, Mo.; and a Wholesale Depot at Wm. King & Bro., No. 2 North Liberty street, Baltimore, Md.

Sample Card and Price-list sent FREE on application.

Wolcott Bros.,

Real Estate and Loan Brokers,

TOLEDO, O.

Real Estate purchased, managed, and sold on commission. Large properties a specialty. Money loaned on Real Estate. All money transmitted through the banks.

Correspondence Solicited.

HARNESS

FOR THE TRACK, ROAD, PARK, or FARM, at $8 to $500 per Set.

Also Blankets, Hood Sheets, and everything requisite for the Track, Road, Farm, or Stable use. The largest variety of Horse Furnishing Goods of any House in this country—no exception. **C. M. MOSEMAN & BRO.,**

Manufacturers, 114 Chambers St., N. Y.

Send for Illustrated Price-List.

Bushberg Catalogue of Grape Vines now ready; sent by mail, post-paid, for 25 cts. Address **BUSH & SON & MEISSNER, Bushberg, Jefferson Co., Mo.**

MAPES' FERTILIZERS.

MAPES' NITROGENIZED SUPERPHOSPHATE.—A Complete Fertilizer, made from Animal Matter (Bone, Flesh, Blood, etc.)

Awarded a *Silver Medal*, Oct., 1874, by the New Jersey State Agricultural Society (Prof. Geo. H. Cook, State Inspector of Fertilizers and State Chemist, Chairman of Committee), for "*excellence* and *quality* of *preparation*."

MAPES' SUPERPHOSPHATE AHEAD OF ALL OTHERS!

See analysis published in last (1875) Annual Report of the New Jersey State Board of Agriculture, Prof. Geo. H. Cook, State Chemist:

Soluble Phos. Acid, 7.90.....Ammonia, 3.40.

Guaranteed Standard, on dry basis, Ammonia, 2.60 to 3.60 per cent; Dissolved Phosphates, 14 to 20 per cent.

(For analyses by State Inspectors of Fertilizers at Savannah, Ga., and Charleston, S. C., January, 1875, see advertisements, pp. 112 and 113, *American Agriculturist*, March No.)

This fertilizer may be applied in the drill, at the time of planting, or broadcast *at any time* on Field, Vegetable, and Grain crops; also for laying down grass lands; also Flower Gardens, Grape Vines, Fruit Trees, etc.

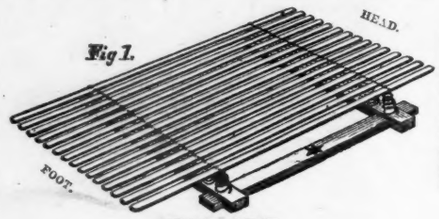
Price, $50 per ton, packed in barrels (250 lbs. net), or new bags, (200 lbs.) No charge for packages or cartage.

For further description of the above fertilizers see advertisements, pp. 112 and 113, March No., *American Agriculturist*, or pamphlets, containing analyses, testimonials, etc. Apply to

CHARLES V. MAPES, 160 Front Street, New York.

HATCH'S SPRING BED BOTTOM.

Fig 1.



Composed entirely of wood and wire; **has no hiding places for vermin.** The slats are adjustable, and reversible, upon the springs. Noiseless, and without lateral motion. The most comfortable and durable Spring Bed in the market. Guaranteed to be strong enough for two persons aggregating 500 lbs. Can be readily taken apart. A full sized bed measures when packed 8 inches square, by 6 feet, and weighs 25 lbs. Is thus extremely portable. **Can be easily taken into the country for the summer, to place under badly made, lumpy beds.**

PRICE LIST.

5 ft. 3 in.	x6 ft.	$7.50	
5 "	x6 "	7.00	
4 " 9 "	x6 "	6.50	
4 " 6 "	x6 "	6.00	
4 ft.	x6 ft.	$5.50	
3 " 6 in.	x6 "	5.25	
3 "	x6 "	5.00	
2 " 6 "	x6 "	4.75	
2 "	x6 "	4.50	

Will send bed, **freight prepaid,** to any R.R. depot east of the Mississippi River, upon receipt of price.

COODELL COMPANY, Antrim, N. H., Manufacturers.

W. S. BLUNT, 77 Beekman St., New York, Agent. Depot of the the People's Pumps.

GRAPE VINES,

Grown especially for the Trade, very fine, and at low prices. CONCORD, HARTFORD PROLIFIC and MARTHA, in large quantities.

A. HANCE & SON Nurserymen & Florists, Red Bank, N. J.

GRAPE VINES.—The largest and most complete collection. Our *illustrated descriptive Catalogue* now ready. Sent post-paid, for 25 cts. Price List free. Address BUSH & SON & MEISSNER, Bushberg, Jeff. Co., Mo.

PLANTS BY MAIL PACKING AND POSTAGE FREE

LADIES READ THIS

Sent safely 2,000 miles.

15 Verbenas, 15 kinds, - -	$1 00
12 Basket-plants, 12 kinds, -	1 00
12 Bedding-plants, 12 kinds,	1 00
8 Roses, 8 kinds, - - -	1 00
8 Geraniums, 8 kinds, - -	1 00

All named sorts, our choice.
100 other things cheap.
A premium offered to clubs.
A 60-page Catalogue free.
21st year. 400 acres, 11 greenhouses.
STORRS, HARRISON & CO.
Painesville, Lake Co., Ohio.

The Bushberg Catalogue
OF
American Grape Vines.

A new enlarged and entirely revised edition of our Illustrated Descriptive Catalogue is now ready. Besides a complete manual and guide for the successful cultivation of the Grape, it contains the most complete description and classification of varieties, so far published. Every Grape grower should have it. Mailed to all applicants for 25 cents.

BUSH & SON & MEISSNER, Bushberg, Mo.

L. B. CASE

offers for the spring sales of 1875 a choice collection of Ornamental Greenhouse and Bedding Plants, in the very best condition, at as low rates as can be found anywhere.

Plants sent by mail to all parts of the country.

RICHMOND, INDIANA.

NANSEMOND SWEET POTATO

and Cabbage Plants. May and June, by mail, post-paid, 65 cents per 100. Express 500, $2.00; 1,000, $3.00; 3,000, $8.00; 5,000, $12.50. Drumhead and Flat Dutch, 500, $2.00; 1,000, $3.00.

S. GRAY, Norwalk, Huron Co., Ohio.

FARM FOR SALE.—Three miles from Saratoga Springs, containing 100 acres, with good buildings. Price, $4,000. Address JOHN H. CARR, Saratoga Springs, N. Y.

The Volcano Gang Plow,

Compared to single plows, will perform TWICE the work with HALF the team, and save at least Eight Dollars per day to any one plowing even no more than 15 or 20 acres. Cuts 24 inches at every round, and works on any land suitable to machine mowing. Light draft; can be managed by a boy or an old man. Endorsed by *American Agriculturist* and COUNTRY GENTLEMAN, as well as by many noted farmers. For full particulars apply to

CARR & HOBSON, 56 Beekman St., New York.

Circulars to all applicants with stamp.

"HEXAMER'S PRONG HOE"
(TRADE MARK)

Hexamer's Prong-Hoe.

PRICE $1.50.

"A man with one of these can do several times as much work as with a common hoe."—*American Agriculturist.*

"We know of nothing that will at all compare with it."—*Country Gentleman.*

"It will do double the work of any hand implement within our knowledge."—*Horticulturist.*

R. H. ALLEN & CO., 189 & 191 Water St., New York.

Agricultural Implements, Seeds, Fertilizers.

OVER 28,000 IN USE.

THE BEST for PRACTICAL PURPOSES.

Seven sizes, for sale by Hardware Dealers generally, and by the makers.

CRAHAM, EMLEN & PASSMORE,

No. 631 MARKET STREET, PHILADELPHIA, PA.

Our Illustrated Catalogue

of valuable books for the Farm, Garden, and Household, will be sent post-paid to applicants.

ORANGE JUDD COMPANY, 245 Broadway, New York.

Standard Architectural Books
FOR CARPENTERS AND BUILDERS.

Hussey's National Cottage Architecture; or, Homes for Every One.—With Designs, Plans, Details, Specifications, and Cost; with Working Scale, Drawings complete, so that Houses may be built direct from the book. Adapted to the popular demand for practical, handsome, and economical homes. Royal Quarto. Six Dollars, post-paid.

Atwood's Country and Suburban Houses.—Illustrated with about 150 engravings. Hints and Suggestions as to the General Principles of House-building, Style, Cost, Location, etc. Post-paid, $1.50.

Monckton's National Stair-Builder.—Is a complete work on Stair-Building and Hand-Railing. Fully explained and illustrated by large scale diagrams, in two colors, with designs for Staircases, Newels, Balusters, and Hand-Rails. Royal Quarto. Post-paid, $6.00.

Monckton's National Carpenter and Joiner.—A complete work, covering the whole science of Carpentry, Joinery, Roofing, Framing, etc., fully explained and illustrated by large scale diagrams in two colors. Royal Quarto. Postpaid, $6.00.

Woodward's National Architect.—1,000 Designs, Plans, and Details for Country, Suburban, and Village Houses; with Perspective Views, Front and Side Elevations, Sections, Full Detail Drawings, Specifications, and Estimates. Also, Detail Drawings to Working Scale, of Brackets, Cornices, French Roofs, Sectional and Framing Plans of French Roofs, Dormer-Windows for French Roofs, Bay-Windows, Verandas, Porches, Plaster Finish, Cornices, Ceilings, Hard-wood Mantels, and all that is required by a Builder to design, specify, erect, and finish in the most approved style. One superb quarto volume. Post-paid, $12.00

Woodward's Cottages and Farm Houses.—188 Designs and Plans of low-priced Cottages, Farm Houses, and Out-Buildings. Post-paid, $1.50.

Woodward's Suburban and Country Houses.—70 Designs and Plans, and numerous examples of the French Roof. Post-paid, $1.50.

Woodward's Country Homes.—150 Designs and Plans, with Description of the Manner of Constructing Balloon Frames. Post-paid, $1.50.

Woodward's Graperies and Horticultural Buildings.—Designs and Plans of Hot-Beds, Cold-Pits, Propagating Houses, Forcing Houses, Hot and Cold Graperies, Green Houses, Conservatories, Orchard Houses, etc., with the various modes of Ventilating and Heating. Post-paid, $1.50.

Wheeler's Rural Homes.—Houses suited to Country Life. Post-paid, $2.00.

Wheeler's Homes for the People.—100 Original Designs, with full Descriptions, and Constructive and Miscellaneous Details. Post-paid, $3.00.

Harney's Barns, Out-Buildings, and Fences.—Containing Designs and Plans of Stables, Farm-Barns, Out-Buildings, Gates, Gateways, Fences, Stable Fittings and Furniture, with nearly 200 Illustrations. Royal quarto. Post-paid, $6.00.

Lakey's Village and Country Houses, or Cheap Houses for All Classes, comprising eighty-four pages of designs. The object, in almost every instance in these designs, has been to secure as large an amount of space and comfort as was possible with the least expenditure of money, without neglecting the exterior features of each building. Royal Quarto. Post-paid, $6.

Eveleth's School-house Architecture.—A new and original work, containing Seventeen Designs for School-houses, Sixty-seven Plates with Perspectives, Elevations, Plans, Sections, Details, Specifications all drawn to working scale, with methods of Heating and Ventilation. Large quarto. Post-paid, $6.00.

Copley's Plain and Ornamental Alphabets.—Giving examples in all styles, together with Maps, Titles, Borders, Meridians, Ciphers, Monograms, Flourishes, etc., adapted for the practical use of Surveyors, Civil Engineers, Draughtsmen, Architects, Sign Painters, Schools, etc. Post-paid, $3.00.

ORANGE JUDD COMPANY, Publishers, 245 Broadway, New York.

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of space elsewhere.

Continued from p. 171.

Hogs versus Dogs.—A newspaper item, says a Missouri farmer reports that in 32 counties, 10,602 sheep were killed by dogs—a loss of $30,000 or $40,000. But this is nothing to his further figures. He says an able-bodied dog will eat as much as a hog will need to thrive on; that the hog, at the end of the year, will weigh 200 lbs., worth, at 6 cts. per lb., $12. Then he says the above 32 counties have 462,000 dogs; and if 462,000 hogs were kept instead, the hogs would be worth **$5,544,000,** or about twice the value of all the school-houses in the state, and double the amount used by the state for school purposes. Well, these are pretty strong calculations; but there are 113 counties in Missouri, and after allowing for a very large reduction in the estimates, there is something left in the item worth thinking and acting about—and not in Missouri alone either. Will not some expert lover of figures and statistics, estimate how long it would take for the actual loss by dogs, and cost of keeping them, over their usefulness, to pay off the entire debt of the United States, that is such a load upon all of us in the way of taxation direct and indirect?

Keeping Farm Accounts.—No doubt that the reason why so few farmers keep regular accounts, is the varied character of the business, and the supposed difficulty attending the necessary book-keeping. Several books have been devised especially for farmers, one of the most complete of which is "The Farmer's Accountant," by C. O. & F. Perkins. This provides for the recording of the expenses of the family, and the outgoes and receipts of the farm; allows accounts to be kept with particular fields, with breeding and other stock, with help, etc. Indeed, it would seem as if every possible want in the way of a farm account book was met. Sold by the Orange Judd Company at $3.

Profit from one Cow and 70 Hens.—"G. B. W.," Columbia Co., N. Y., sends the following statement of one cow's product for 1874, viz: 256 lbs. of butter, sold for $92.08; one calf raised, and a family of five supplied with butter and milk. From 70 hens, 252 dozen of eggs and 150 chickens, were sold for $133.91, leaving $52.86 profit, after paying $81.05 for feed. Eggs and chickens were also supplied to the family.

A Shaving Horse.—"C. R. F.," Winchester, Ill. A shaving horse was illustrated in an article upon hoop-poles, in the *Agriculturist* of Jan., 1875.

The Tumbler Cart.—"A. D. E." The tumbler cart illustrated not long ago in the *Agriculturist*, can easily be made by any wheelwright, from the description given with the engraving. It is simply a body hung upon a bent or straight axle, and is tipped by a chain wound upon a roller in front of it.

Catalogues Received.

The following catalogues and business circulars have come to hand since the publication of the last list. Please observe that some dealers carry on two and sometimes three branches of business, but we can only afford space to name them once, under what we take to be the leading department. Hence it will pay to look the all through.

SEEDSMEN.

J. H. & W. G. Cone, Hartford, Conn. Wethersfield garden seeds, wholesale and retail.

Donnelly & Co., Rochester, N. Y. Flower seeds and summer flowering bulbs.

D. M. Ferry & Co.'s Seed Annual, Detroit, Mich. This, by accident, was omitted from last month's list, which we particularly regret, as it is one of the most noticeable of all, and shows remarkable enterprise. Its illustrations are, at least the majority of them, new, and it is altogether an interesting work of 218 pages.

Jordan Horticultural Company, St. Louis, Mo., send two catalogues, one of seeds and wire-work of their own make, and another of nursery and greenhouse stock.

John R. & A. Murdoch, Pittsburgh, Pa., who, besides flower and vegetable seeds, offer a full stock of greenhouse and bedding plants.

Geo. W. Park, Fannettsburgh, Pa., has seeds; also Park's Floral Gazette, to tell what to do with them.

WM. RENNIE, Toronto, Ont., Canada. Flower garden and field seeds, with several specialties.

J. B. ROOT, Rockford, Ill., offers, besides seeds, a large collection of vegetable plants from his hot-beds, and has a neat and instructive pamphlet to go with them.

TILLINGHAST BROS., Factoryville, Wyoming Co., Pa. Garden and flower seeds, and seed potatoes, some of which are not generally known.

VICK'S FLORAL GUIDE, No. 3, gives interesting notes of his California trip; useful hints, and a proper dig at the new postal law. It is perhaps necessary to add that we mean James V., of Rochester.

H. W. WILLIAMS & SON, Batavia, Ill., send three documents; seed and plant catalogues, and a potato circular, which gives instructions in cultivation.

NURSERYMEN.

C. H. BANTA, Rivervale, Bergen Co., N. J. Fruit and ornamental trees, and greenhouse stock.

D. C. BENTON, Quincy, Ill. General nursery stock and greenhouse plants.

BIRD BROS., Newark, N. J., at the Kearney Nursery, besides the usual stock, make a specialty of evergreens.

BUSH & SON & MEISSNER, Bushberg, Mo. Grape vines. This descriptive catalogue is the most complete of anything of its kind that has come to our notice. It is in fact a treatise with more full descriptions and history of each variety than can be found elsewhere, and deserving of a more extended notice than can be given here.

A. P. CHAPMAN, 50 & 52 Vesey st., N. Y. Small stock by wholesale a specialty.

E. J. HOLMAN, Leavenworth, Kas., sends the wholesale list of Astra Nursery.

THOS. JACKSON, 50 & 52 Vesey st., N. Y. Wholesale nursery stock.

SAMUEL KINSEY, Dayton, O. Small fruits, ornamental plants, seedling stocks, etc.

J. W. MANNING, Reading, Mass., has a full assortment, including a number of specialties and novelties.

C. S. PRATT, North Reading, Mass., small fruits.

P. T. QUINN, Newark, N. J., has small fruits, a select list of pears and apples, and various vegetable plants.

E. & J. C. WILLIAMS, Montclair, N. J., offer the leading small fruits, seed potatoes, etc.

GREENHOUSE PLANTS.

P. J. BERCKMANS, Augusta, Ga., has, besides an extensive nursery, a large range of greenhouses, and offers a fine collection.

BURROWS, WOOD & Co., Fishkill, N. Y., include in their plant catalogue a list of fruit and other trees.

B. P. CRITCHELL, Cincinnati, O., has flower seeds as well as flowering plants.

JOSEPH HEINL, Jacksonville, Ill. A compact but full catalogue of ornamental plants, and a fruit list.

HOOPES BRO. & THOMAS, Westchester, Pa., send a plant catalogue almost as large as their list of trees, and it includes various novelties.

G. W. PENNEY, Newark, O., keeps pace with the best in having new things.

J. D. ROBINSON, Bloomington, Ill., though a new accession to the ranks, is, as we happen to know, a competent one, and deserving of success.

JOHN SAUL, Washington, D. C., comes rather late with his catalogue, perhaps because large bodies travel slowly, for this is very large and very full, and the colored plate of the new Queen Victoria Pelargonium makes one impatient to see the plant.

A. WHITCOMB, Lawrence, Kansas, has not so large a catalogue as some, but it is very neat and compact.

WM. C. WILSON, Astoria, (L. I.), N. Y., and 43 West 14th St., N. Y. This immense establishment has about everything, whether new or old.

EUROPEAN CATALOGUES.

WM. BEYCE & Co., Glasgow, Scotland. Wholesale list of vegetable and field seeds.

E. G. HENDERSON & SON, London, England. A seed catalogue that for variety in all departments, is wonderfully full.

TROUPIN-MORREN, Liege, Belgium. Seeds of all kinds, bulbs, roses, etc.

CH. HUBER & Co., Hyères, France. Wholesale price-list of choice plants; Cannas a specialty.

POULTRY, IMPLEMENTS, AND MISCELLANEOUS.

ADRIANCE, PLATT & Co., 155 Greenwich St., N. Y. The world renowned Buckeye Mower & Reaper, which last year took over a dozen premiums at field trials in Europe, and in this country prizes too numerous to mention. So neat and tasteful a catalogue deserves a more extended notice than is here given.

ADAMS & FRENCH HARVESTER. Made by the Sandwich Manufacturing Company, Sandwich, Ill. This implement does not quite make the wheat into bread, but it advances it well towards its destination.

AVELING & PORTER'S Road Locomotives, Steam Rollers, and other implements, some of which have already been described in the *Agriculturist*. Wm. C. Oastler, 43 Exchange Place, N. Y., importer.

BOOKWALTER ENGINE. A portable Steam Engine, for farm and other work. Foos & Jayne, 109 Liberty St., N. Y.

FRED. F. HARRIS, Portland, Maine. Improved Fowls, and Berkshire pigs.

PECK & SKILTON, Westville, Conn., make a great variety of tasteful rustic work, and red-cedar labels of various size and styles.

C. R. RAYNOLDS & Co., New York. An old established color house, send out a treatise on the use of Paris green, and a history of the Colorado beetle.

WOOD, TABER & MORSE, Eaton, N. Y., tell the history of their Portable and Stationary Agricultural Steam Engines.

VALENTINE & Co., Varnish makers, 323 Pearl St., N. Y., send out a business document that is a wonder in the way of beauty, neatness, and interest, it being an account of "How Varnish is Made," copiously illustrated by descriptive engravings, and embellished with several charming silhouettes.

"Walks and Talks" Correspondence.

VALUE OF ESSEX PIGS.—"Champernoun," of Maine, writes as follows to the *Agriculturist*, and the editor sends it to me: "Please tell us through the *Agriculturist* the peculiar excellencies of the Essex pig, that makes it worth four or five times as much as ordinary pigs?"—The Essex is a remarkably quiet pig. He has fine bones, thin skin, small head, and little offal. He is an "easy keeper." The lard is very white and firm, and the quality of the pork is excellent. Whether he is worth four or five times as much as ordinary pigs, depends on how you use him. For crossing with and improving common swine, I would rather pay $25 for a pure bred Essex boar at two months old, than to take a mixed bred or common boar for nothing. And I think this is the testimony of all who have tried pure bred boars of *any* good breed.

PLASTER ON LIMESTONE LAND.—"H. W. S.," of Cincinnati, Ohio, writes: "I often notice recommendations to use certain manures, and generally without any reference to the chemical composition of the land."—All soils contain the same elements of plant-food. They differ only in the proportions, and in the degree of availability. An ordinary soil analysis throws very little light on the matter. We have to judge from experience and actual trial.—"I wish to enquire," continues H. W. S., "if plaster would be beneficial or harmful here, when our whole neighborhood is underlaid with limestone, and when I should suppose the soil is already highly impregnated with lime."—This has nothing to do with the action of plaster. Limestone land is often greatly benefited by liming. And plaster is perhaps usually more efficient and valuable on dry limestone land, than on any other. Try two bushels per acre on clover or corn. I think it will be found valuable for clover, and perhaps for corn. My own farm is a limestone soil, and plaster is a very useful manure for clover, corn, potatoes, peas, and sometimes for barley, grass, and wheat.

OATS AND PEAS.—I have a dozen or more letters asking about my plan of sowing oats and peas together. All I can say is that it is a good crop with me, provided the land is rich enough. If peas do well in your section, and you have a rich piece of ground, and want feed for sheep, drill in two bushels of peas and two bushels of oats per acre. The black-eyed Marrowfat is a good variety for this purpose—or for sowing alone. I drill in the seed mixed carefully together, and in sowing stir the seed occasionally in the hopper.

GREEN MANURING FOR CORN.—"I have a field of 25 acres," writes a correspondent at Trenton, N. J., "to be put in corn in 1876. The field is seeded with clover and timothy, and has been mowed twice. Now which of the following plans would be preferable? 1st. To plow the crop of grass under, the middle of June, and sow the ground with oats and rye, to be plowed down again in the fall, just before frost. Plow again in the spring and plant corn. 2nd. Let all the growth of 1875 remain upon the ground, and plow under in spring of 1876, in time for planting corn. Is there anything better for sowing in June or July than oats and rye? I keep a dairy of 25 cows, which are fed mainly on fodder corn in summer."—I do not think oats and rye a good crop for green manuring. White mustard, if the seed did not cost so much in this country, would be better for sowing in June or July, for this purpose, or buckwheat, or even corn fodder. But I must confess that I do not like the plan of green manuring, unless you can do nothing better. It is a great waste of valuable food. The 2nd plan is open to the same objection. I should not like to see good grass rotting on the land, with 25 cows eating corn-fodder in the yards. I do not see what is to be gained by it. I would rather keep more cows and raise more corn-fodder and good, rich grass. I *think* I would sow 150 lbs. of superphosphate, and 150 lbs. nitrate of soda, per acre, on the grass field. Mow it for hay. Then pasture it in the fall, and, if desirable, plow up and plant corn the spring of 1876. You will find yourself with 30 or 40 tons of good hay in the barn, and this will help to make manure for the corn crop, and the *nutriment* in the hay, (which is of no value as manure), ought to be worth much more than the cost of the artificial manures.

BRAN AND CLOVER FOR PIGS.—"D. B.," Champaign, Ill., writes: "My Essex sow and boar are doing well. It is hard to keep them down to breeding condition. Have reduced their feed to pure bran, scalded with slop water, and although they get not more than half as much as they would eat, they are still too fat. I have four five-months-old pigs. Same trouble with them. With four parts of bran and one of meal, by measure, they are curiosities of adiposity. Had I clover hay, would cut and feed as you state in Walks and Talks you do with your breeding sows. How is it that bran, containing so small a proportion of fattening matter, should have such an effect when fed?"—There is more nutriment in bran than many think. Until your pigs get to be seven or eight months old, such food as you describe will not hurt them, no matter how fat they get. They ought to be fat. They have been bred to take on fat at an early age. The pen of five pigs, under six months, I showed at the N. Y. State Fair last year, weighed about 200 lbs. each. They had been fed bran, corn meal, and some milk. I suppose they would be considered too fat for breeders. But such was not the case. After the fair I turned them out in a pasture. They are as healthy, thrifty pigs as any in the herd. I think the true plan is to feed well-bred pigs all they will eat and digest, as long as they are growing rapidly. When they have nearly got their growth, if intended for breeders, let them have less nutritious food, and plenty of exercise.

MANGEL-WURZEL.—"C. H.," Bloomington, Ind., wants to raise an acre or two of mangels. "Can they be drilled by hand" he asks, "as there is no such a thing as a small seed drill here."—There are several good drills advertised in the *Agriculturist*. If you sow by hand, the better plan is to mark out the rows 30 inches apart, and then drop two or three seeds in holes, made in the row, 15 inches apart. I used to plant in this way before I used the grain drill. It has some advantages over drilling. You can soak the seed for 48 hours, and the plants come up quickly, often a week or ten days earlier than if not soaked. Then if you know your hills are 15 inches apart, as soon as you can see a plant in a hill, you can hoe on each side of it, knowing that there are no more plants for fifteen inches. For making the holes in the row, take a piece of pine scantling, 3x3. Bore inch holes in it 15 inches apart. Put pegs in the holes, and let them project downwards two or three inches. Bore a hole in the center, and drive in an old rake or hoe handle, on the side opposite the pegs, and you have a useful tool for making the holes.

In regard to the culture of mangels, all I need say is, if you raise good beets in the garden, the same treatment will enable you to raise mangels in the field. No matter about the kind of soil, or the kind of manure. Make the former mellow and clean, and apply plenty of the latter, and harrow it into the soil after spreading, and then plow it in. Harrow again and again, and roll before and after planting.

VALUE OF MANURE FROM BRAN, &C.—A Maryland subscriber writes to the *Agriculturist* that "Walks and Talks" in the February number must have made a mistake in putting the value of the manure from a ton of wheat at $11.94, and that from a ton of bran at $24.32.—If I have I do not know it. If he will read my remarks again, and tell me where the mistake is, I will correct it. He thinks if my figures are correct, any farmer can make money by feeding stock. Perhaps so. But all I wished to show was that my neighbor could get nitrogen and phosphoric acid cheaper by feeding stock than by buying artificial manures.

BONES AND HOW TO USE THEM.—"Z. H. P.," Delaware, writes, that he looks upon bones as the best fertilizer, and wants to know how best to use them.—I would not dissolve them in acid, for any farm crop except turnips.—"Will it pay," he asks, "to use potash with bones for wheat?"—I think not.—"Would you compost the bone dust with horse manure for corn?"—It is a good plan. But probably your heap will get too hot. Ordinary farm manure containing cow and pig as well as horse manure, will not be so liable to ferment too rapidly when mixed with the bone dust.

WHAT TO SOW ON CORN STUBBLE.—"G. W. C.," Xenia, Ohio, has a good farm. His corn crop on clover sod av-

erages 80 bushels shelled corn per acre. Has raised as high as 95 bushels per acre. Oats do not do well. Has never raised peas. He wants to sow some crop on the corn stubble and follow it with winter wheat. He asks: 1st. "Would potatoes, if manured with well rotted manure, leave the land in good condition for wheat?"—Yes; unless it is too light and sandy, but your manure should be rich, and you should use it freely, say 15 tons per acre.—2nd. "Would mangel wurzel be off in time to sow wheat?"—No.—3rd. "Would oats and peas be apt to succeed. Have raised oats six feet high."—I cannot say, but I think you would be warranted in trying a few acres.—4th. "If oats are sown, would it not be better *for the land* to cut them green and cure as hay?"—This is the prevalent idea, but I doubt if it is true. The grain in ripening gets its nutriment from the straw, and not directly, to any considerable extent, from the soil.—5th. "Would the oat-hay be worth as much as the ripe oats?"—I suppose you mean ripe oats and straw together. This may or may not be the case. If I could get a good crop of heavy oats I would let them stand; but if, as you say, you can grow straw, but not grain, I would cut and cure as you propose.—6th. "Do you feed mangels cut or uncut?"—I cut them for sheep and cows and young pigs. Feed whole to large pigs.—7th. "Would you drill the mangels or raise the plants in beds and transplant?"—I have rarely had "good luck" in transplanting mangels. I do not think the plan a good one in our dry climate, and with our high wages.

UNDERDRAINING.—"G. R. S.," Whiteside Co., Ill., has a rolling farm. The water accumulates in the intervales and sometimes destroys the corn and other crops. He asks about underdraining it. I should dig holes in the land three feet deep, and if the water remains in them four or five days after rain, it will probably pay to underdrain. But if not, I would try to get off the water by plowing a deep dead furrow through the lowest land.

SEEDING DOWN A YOUNG APPLE ORCHARD.—"J. F. K.," Pa., writes: "My orchard has been very much neglected. Last fall I set out a lot of young trees. I intend to manure and lime it well, and then seed down with rye and orchard grass, after which I intend to pasture with calves and hogs."—Put the lime on the old orchard; plow it shallow *early in the spring*, or *late in the fall*. The young orchard I would keep in fallow for two years, and work it thoroughly. Then seed down with grass and white clover alone, without the rye.

ARTIFICIAL MANURE FOR CORN.—"An Old Subscriber," Wis., writes: "I have 40 acres sandy clay soil, which has been in wheat every year for five years. Plowed last fall eight inches deep. Shall plant it to corn this spring, in hills 4 feet apart each way, and keep well cultivated. What artificial manure would you advise me to apply to the corn?"—I know of no artificial manure that you can apply with profit. Corn is too cheap with you, and manures too dear. Sow a bushel of plaster per acre on the hills after the corn is up. This will probably pay. Grow less wheat and more clover.

Four Calves at a Birth.—"W. J. C.," Indiana Co., Pa., reports the birth of four calves by one cow in one day. The first two are now alive and doing well, the other two were dead. The weights were 57, 56, 52, and 46 lbs., in all 211. The cow is raising the two calves successfully.

Trouble with Poultry.—"C. G. M. B." If wood ashes are strewed upon the floor of the chicken house, and allowed to mingle with the droppings, there will soon be trouble in the house. The escape of ammonia caused by the ashes will injure the eyes of the fowls, and they will suffer greatly, and in the end become blind. The cause of your trouble is obvious.

Veterinary Practice.—"Dr. H. J. R.," Utah. It would be of immense service to farmers if country physicians would study veterinary surgery, and practice so that they could give advice in regard to troubles with farm stock. It would tend to rid the country of hosts of quacks and "cow-doctors," so called, who are very ignorant of what they profess, and would save much suffering that is now inflicted upon animals. Dr. Dadd's Horse Doctor, and Dr. McClure's Diseases of Cattle, would be useful books to have. Chauveau's Anatomy of the domesticated animals, is a highly scientific work, of value to both veterinary and other practitioners, but useless to any but educated amateurs.

Where Does the Rain Come From?—Some suppose that the rain clouds are driven over us *from some where else*, and drop down the water. The fact is, the rain is in the air over us at all times, even in the clearest weather. The air takes up water in the form of invisible vapors. The warmer it is, the more water it can thus retain concealed, cool it, and it gives up some of this concealed water; the particles coalesce to form visible vapor or clouds, or mists, or fogs, and if the cooling goes on, the vapor drops unite and fall in larger rain drops. If a portion of air above us is at 50°, and contains 300 grains of invisible vapor, and another similar amount of air at 30°, containing 200 grains of vapor, comes along and mixes with it, the whole air will then be only at the temperature of 40°, and will be able to hold only 500 grains, and as the two portions contained 300+200 or 1,000 grains, 200 grains of water will become mist or clouds, or in part fall as rain. Thus it is, that the mixing of warm and cold air, or the cooling of the air from any cause, squeezes out of it, so to speak, the water that was before held entirely concealed as invisible vapor.

Potash for Potatoes.—"W. J.," Jacksonville, Fla. There should be no difficulty in getting plenty of wood ashes in Florida, without buying potash. Palmetto stems yield a larger amount of it than any other vegetable substance. If, however, potash must be bought, it is best to procure the German salts, (Kainit). It may be purchased of the dealers in fertilizers in New York and elsewhere.

How to use Hen Manure.—"D. P. M.," Brooksville, Vt. The manure from the poultry house is valuable for any crop. It may be spread on grass very thinly, about two barrels per acre is enough. One way to get it fine, is to spread it upon the barn floor and trash it with a flail, but a wet cloth should be tied around the mouth or nose while this is being done.

It is useless to write for our opinion about sowing seeds, killing pigs, or having calves born in the light or the dark, the new or the full, the wax or the wane of the moon—or whether water can be found by the use of a witch-hazel or other rod—or if wheat will turn into chess—or if a doctor who advertises his cures, or warrants to cure will do what he promises. It is a waste of time, stationery, and postage, to write us upon any such matters, as we have better use for space in the paper than to reply to such there, and better use for our time than to reply by mail if postage is sent for an answer.

Many Keys in One.—It is often convenient to have a key that will wind more than one watch, and J. S. Birch, 37 Maiden Lane, N. Y., makes a key that will wind any watch. It is adjustable at once, by a mere touch, and is one of the clever little inventions that add much to one's convenience.

Pond Muck.—"A. B. K.," Lancaster Co., Pa. The sediment of mill ponds and races is generally of the same character as swamp muck, and will answer the same purpose for an absorbent or a fertilizer. It should be dry and allowed to drain for one season, if it is to be used in the stables. If not, it may be mixed with lime as it is dug.

An Inch of Rain.—An acre of land contains 43,560 square feet of surface. A cubic foot of water weighs 62½ lbs.—A wine gallon of water contains 231 cubic inches, and weighs about 8⅓ lbs., (or accurately, 8.3388822 lbs.) This is the Winchester or standard gallon of the U. S. [The N. Y. standard gallon weighs 8 lbs.] —A barrel of 31½ gallons standard, weighs 262½ lbs., (accurately 262,67469 lbs.) *Therefore:* An inch deep of rain on an acre supplies 226,875 lbs.. or over 113 tons, or 868¾ barrels of water. Every one can readily tell how much water is supplied by each inch of rain-fall upon his farm, or village plot, or city lot, or upon the roof of his dwelling. For example, if his house be 20 by 30 feet, there will be 600 square feet, allowing nothing for projecting eaves, and each inch of rain will give 600×144÷1728, or 50 cubic feet of water, equal to 3,125 lbs., (over 1½ tons,) or nearly 12 barrels, and 42 inches rain per annum, would give about 500 barrels....At our country residence, over 5 inches (5.183 in.) of rain fell during March 1875. This amounted, on a single acre, to over one million, or 1,175,893 lbs., or 4,473 barrels; that is, about 580 tons, or 4,473 barrels of water-fall on each acre for the month of March alone. In all cases snow is melted, and its water reckoned in the rain-fall....A drain-pipe, 2 inches in diameter, if the water all moves in it at the rate of 3 miles per hour, will discharge about 347½ cubic feet per hour, or in 10½ hours would carry off 1 inch rain-fall on an acre....The *average* annual rain-fall at Cambridge, Mass., is 38 inches; at Philadelphia, Pa., 45 inches; at Western Reserve College, O., 36 inches; at Marietta, O., 41 inches; at Fort Crawford, Wis., 30 inches; at St. Louis, Mo., 32 inches; in the British Islands, 32 inches; in Western France, 25 inches; in Eastern France, 22 inches; in Central and Northern Germany, 20 inches; while in some tropical regions, the amount runs up to 100, and in a few localities, to over 200 inches. At Catskill, N. Y., July 26, 1819, 18 inches fell in 7½ hours....Taking an average of 40 inches rain-fall a year, we have of rain-water, on every acre, 9,075,000 lbs., or 4.237½ tons, or 34,533 barrels.

Salt Pork for Cows.—"J. A. W.," recommends a few slices of salt pork to be rolled in rye bran or corn-meal, and given to a cow that is ailing, having a poor appetite, or having "lost her cud," or is suffering from indigestion. This is simply a ready substitute for a dose of linseed oil, which is quickly effective in such cases. The stomach seems to sometimes need fat as well as salt, to assist digestion, and the salt of the pork is both useful in itself, and acts as an inducement to the cow to swallow the pork.

Why Sparrows?—A gentleman writes from Richmond, Ind., inquiring if European sparrows can be procured, as it is proposed to introduce them into one of their city parks.—Have the Richmond people duly considered this matter? The birds have now been long enough in this country for us to estimate them at their true value. If the trees of a park, or in the streets of a city, are infested by caterpillars to an injurious extent, and ordinary birds, and other means of destruction failed to get rid of them, then, and only then, should we try sparrows; but where there is no special need for them, we consider their introduction a great mistake. In the rural towns around New York, to which these birds have migrated, they have driven out every native bird, and where the songs of our warblers, song sparrows, and other singing birds were frequent, now nothing is heard but the incessant and monotonous twitter of innumerable foreign sparrows. They will break up the nests of other birds, and even build their own nests over the eggs of the other birds, and by these acts and constant warfare, they soon drive off the more peaceful natives. In a large and crowded city like New York, where few native birds come, this objection has little force, but smaller cities and rural towns better keep clear of them.

Salicylic Acid.—This, though not a new substance, has all the interest of a new one, on account of the recent discovery of properties possessed by it which were heretofore unknown. It derives its name from *salicin*, the bitter principle of the willow, (*salix*), as it was first obtained from that; and it is an important constituent of oil of wintergreen. More recently salicylic acid has been derived from carbolic acid, but the chemistry of the substance will hardly interest the general reader. It is white, in minute crystals, has no odor, a slightly sweetish taste, and is but little soluble in water, an ounce of that taking up only a grain and a half of the acid. The remarkable thing about it is its ability to prevent decomposition of all kinds, whether in animal or vegetable substances. The chief use made of it thus far is in dressing wounds, where it completely prevents all offensive odor. If all the accounts given of it are true, it is the most powerful antiseptic yet discovered, much superior to carbolic acid, and without its disagreeable odor and poisonous qualities. Thus far its use has been mainly confined to surgeons. It now sells for about $1 an ounce, but when it becomes cheaper, as it is likely to be, a great number of uses will be found for it in common life.

The Suez Canal cost $95,000,000, ($23,000,000 more than the Erie Canal,) of which the Egyptian Government contributed $31,000,000, leaving the net cost to the share-holders $64,000,000. The tolls and other receipts for 1873 were $4,945,000, the expenses (23 per cent) $1,125,000, leaving a net revenue of $3,820,000, of which $2,345,000 were appropriated to interest on bonds of $20,000,000; sinking fund, $450,000, etc., leaving $1,475,000, or 3¾ per cent, for dividends to the share-holders. The receipts for 1874, and future years, are expected to show continuous increase, so that the enterprise is nearly certain to be a paying one. These figures are not only interesting as connected with this great international work, but as indicative of the value of the proposed ship canal across the Isthmus of Darien. Our Minister to China, in 1872, reported the United States trade to be about 37 per cent of the whole foreign trade of China. In that year tea was brought from China to Boston, via the Suez Canal, at a cost of 4 cts. per lb.; via steamship to California, and thence by Railroad, 7 cts. per lb.

Tule and the "Chinee."—"F. W. W.," Wis., sends an item in which it is stated that the Chinese in California have found the roots of the *Tulé*, (pronounced Toolay), valuable as food, and that they find a ready market at 6c. per pound, and wishes to know what it is, etc.—The rivers of California have hundreds and hundreds of acres of their margins occupied by a sedge known to botanists as *Scirpus lacustris*, and to the Mexicans as *tulé*, a name which Americans have adopted for the plant, and the places where they grow are called tulé lands. But the Pacific Rural Press, which is no doubt well informed, says it is not the tulé root at all that the Chinaman is after, "but a species of artichoke that grows among the tulés."—Evidently some tuber-bearing Helianthus, related to the Jerusalem Artichoke.

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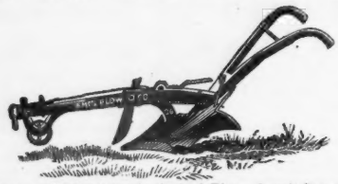

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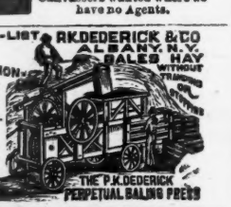

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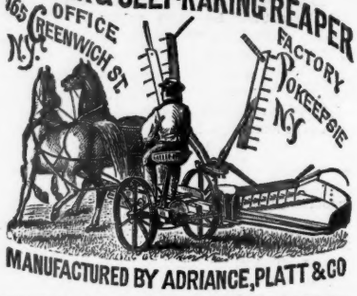

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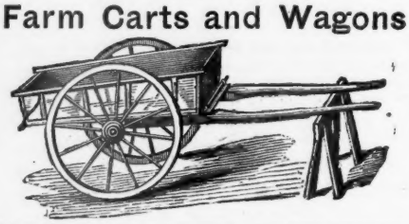

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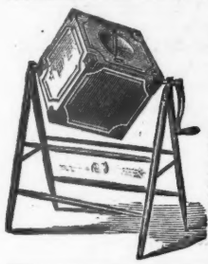

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Rectangular CHURN,

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Circulars sent free.
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Every One Using it once will use no other.
Three sizes made, holding five, seven and ten gallons.
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with removable Ice Chambers, patented Jan'y 12, 1875. *A great improvement on the old style with stationary chambers.* They are made in the most durable manner, with galvanized iron or brass hoops, hinges, hasps, and fixtures, are neatly tinned to prevent rust, and for shipping or market use can not fail to give entire satisfaction.
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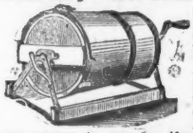
"THE BEST IN THE WORLD."
Blatchley's Horizontal Ice Cream Freezer.



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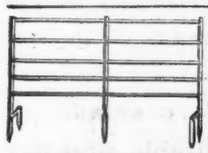

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Can be set up with ease—is an absolute protection against cattle—is ornamental, and practically indestructible. Is superior to every other form of enclosure.
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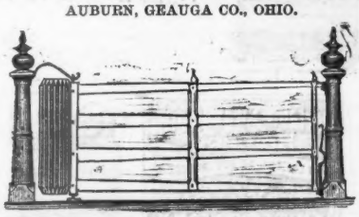

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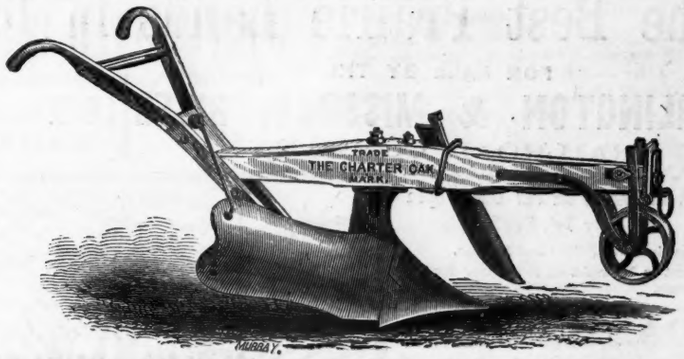

A REVERSIBLE PLOW,

Adapted to General Work, described as follows:

1st.—The Share has an inner or swivel-angle, less than a right angle, which allows the erect edge, when in position, to coincide with the line of the standard and coulter, which last is fixed in the center of the beam. Thus the relation of these important parts is identically the same, as in the common fixed or "land-side" plow.

2nd.—The form of the Mold-Board is such that, instead of presenting an angular or rounded ridge to the furrow-slice, especially when the plow is driven deep, it opposes a flat surface, having only the curve necessary to turn the furrow properly. This form enables the plow to be run at various depths, at no disadvantage to the quality of the work.

3rd.—This Plow is adjustable to different widths of furrows, taking more or less land, as may be desired. The pivoting of the share to the standard admits of this, and it is regulated by the brace, which holds in position the rear end of the mold-board, to which a greater or less outward set is given, and to the share a greater or less landward set.

4th.—An elastic and adjustable Draft-Rod, preventing straining of the team and breakage of the plow and harness.

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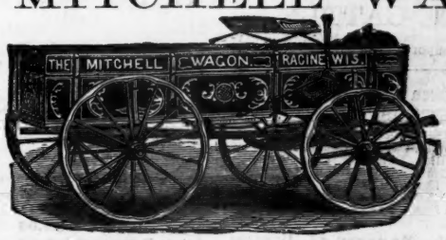

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The only Ring invented that will effectually prevent Hogs from Rooting. Being a Double Ring, and having no sharp points in the flesh, it does not cause irritation or soreness, as in other Rings. The smooth part of the wire being in the nose, it heals rapidly. One of our rings being equal to two or three of any other ring, makes this ring cheaper than the cheapest. Time and money saved in using the Champion. One operation, and the work is done.
Price of Hog Ringer, 75c. each; Coppered Rings, 50c. per 100; Tinned Hog Rings, 60c. per 100; Hog Holder, 75c. each.
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Canvassers wanted where we have no Agents.
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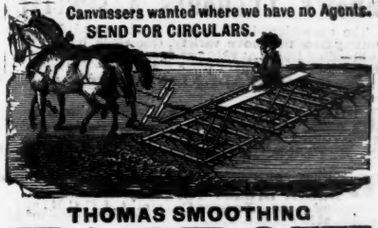

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Stone and Ore Breaker
Crushes all hard and brittle substances to **any required size.** Also, any kind of STONE for ROADS and for CONCRETE, &c.
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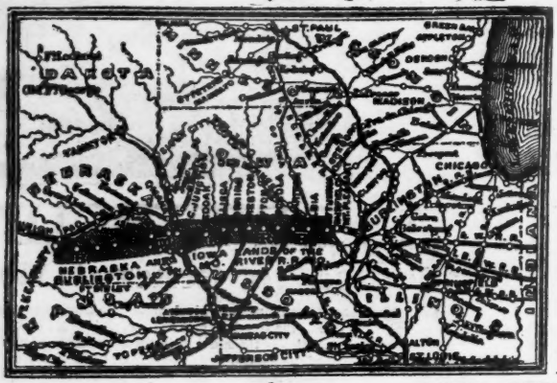

NOW IS THE BEST TIME.

If this meets the eye of any person who is contemplating moving to the west, and who is deterred from doing so by the marvellous stories which have gained credence about the Nebraska grasshopper troubles, it will be well for him to remember that even if all the stories were true, the number of people said to be in destitution would only amount to five per cent of the population of the State. Hence it may be seen how absurd are the reports circulated as to the whole State being in distress, &c.

The grasshoppers did visit the section through which the Burlington & Missouri River Railroad runs; they carried away the corn, and so worked havoc among the settlers, many of whom having come into the country but recently, and being dependent in a great measure upon their first crop, were frightened away; and their want of courage affords the best possible opportunity for obtaining some of the finest tracts of land in the State at bottom figures.

Now is the time to come, therefore, to secure good bargains.

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WM. S. TILTON, of Togus, Maine,
breeds and has for sale Holstein and Jersey Cattle, Cotswold Rams, Berkshire and Poland-China Swine, and Trotting Colts of Mambrino, Hampletonian and Knox blood. Will deliver stock in Boston, New York, or Baltimore. In 1874 Mr. Tilton was awarded eighteen prizes at the Maine State and New England Fairs.

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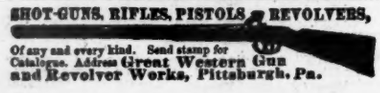

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for sale in lots to suit customers. This article is sold for *half the price* of other fertilizers, and is cheaper for *Cotton*, *Corn*, *Tobacco*, and *Vegetables*, than any other in the market. Price, delivered on board in New York City, **$25** per ton. I ask attention to the following testimonials:

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	Ashton Salt.	*Onondaga Factory Filled.*
Chloride of Sodium	97.65	98.38
Sulphate of Lime	1.45	0.91
Sulphate of Magnesia	0.05	.05
Chloride of Magnesia	0.06	.00
Sulphate of Soda	.00	.05
Insoluble matter	.05	.12
Water	.76	.60
	100.00	100.00

Circulars in regard to various tests made with this salt in comparison with the best foreign article, also certificates from a large number of the best dairies in the State as to its quality, may be had on application to J. W. BARKER, Secretary, Syracuse, N. Y., to whom orders for salt may also be addressed.

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Inquire for *Onondaga Factory Filled Dairy Salt.*

J. W. BARKER, Pres. & Sec'y.

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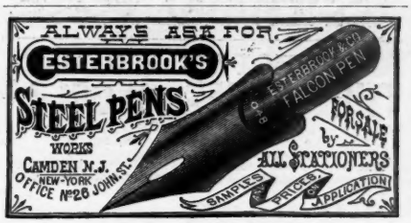

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It will do more work with less labor and expense, and give a more elegant and lasting lustre than any Stove Polish ever produced. *A stove can be dressed on delicate carpet without soiling it.* Manufactured only by

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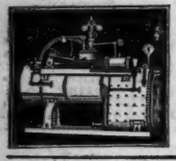

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